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Mose/Fbe

INSTALLATION RESTORATION PROGRAM
ACTION MEMORANDUM
SPILL SITE SS-017
BUILDING 2774
PLATTSBURGH AIR FORCE BASE
PLATTSBURGH, NEW YORK

Contract No. F41624-94-D-8106
Delivery Order 003
CDRL # A030
Document Control # 070

Submitted to:

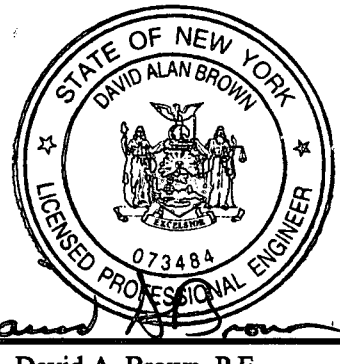
Air Force Center for Environmental Excellence
Brooks Air Force Base
San Antonio, Texas

Submitted by:

Parsons Engineering Science, Inc.
Liverpool, New York

and

OHM Remediation Services Corp.
Austin, Texas



David A. Brown, P.E.
Project Manager

SEPTEMBER 17, 1996

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BUILDING 2774

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ACTION MEMORANDUM

DECLARATION STATEMENT

Installation Restoration Program
Spill Site SS-017, Building 2774
Plattsburgh Air Force Base, Plattsburgh, New York

1.0 STATEMENT OF BASIS AND PURPOSE: This decision document represents the selected removal action for Spill Site SS-017 at Plattsburgh Air Force Base (PAFB), New York, developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended, and not inconsistent with the National Contingency Plan (NCP). This decision is based on the administrative record for the site.

2.0 ASSESSMENT OF THE AREA: Conditions presently exist at PAFB Installation Restoration Program (IRP) Spill Site SS-017 which, if not addressed by implementing the removal action documented in this Action Memorandum, will lead to (1) actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, and (2) migration to the local groundwater of high levels of additional hazardous substances or pollutants or contaminants.

3.0 DESCRIPTION OF THE PREFERRED ALTERNATIVE: The preferred removal action alternative addresses the principle threat of Spill Site SS-017 by addressing volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) present in vadose zone soils. The preferred alternative for Site SS-017 vadose zone soils is based on available site information and will follow the Presumptive Remedy Approach (EPA 540-F-93-048), which in this case consists of soil vapor extraction (SVE) and bioventing to treat vadose zone soils contaminated with VOCs and SVOCs. SVE and bioventing are recommended based on site investigation data. SVE will be implemented at all areas at site SS-017 that have been shown to contain trichloroethene (TCE) as well as other non-chlorinated hydrocarbons. Bioventing will be implemented in those areas that contain only non-chlorinated hydrocarbons.

The SVE and bioventing system will be installed and tested at Spill Site SS-017 in September of 1996. The SVE system to be installed in the two larger areas of contaminated soil will include four extraction wells manifolded to a single regenerative vacuum blower. Another relatively small and isolated area that was shown to contain TCE will also be treated via SVE by a single well system connected to another smaller capacity vacuum blower. Based on the relatively small areas of contamination and low levels of volatile contaminants it is not anticipated that off-gas treatment will be necessary. However, to ensure that New York State emission limits are not exceeded, activated carbon will be used during start-up to treat the SVE off-gas and the system will be operated at a relatively low flow rate.

Bioventing will be implemented in the two areas that were shown to contain only non-chlorinated petroleum hydrocarbons. The bioventing portion of the system will include two vertical air injection wells located in the approximate center of each of the

contaminated soil areas. Air will be injected into the two wells by the use of separate regenerative blowers.

Cleanup of the vadose zone soils at Spill Site SS-017 at Plattsburgh AFB will be considered complete when the recommended cleanup levels as specified under New York State Department of Environmental Conservation (NYSDEC) Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046 are met, or when asymptotic removal of contaminants is reached and no significant additional removal can be expected to occur.

4.0 STATUTORY DETERMINATION: The preferred remedial alternative protects human health and the environment, complies with applicable or relevant and appropriate federal and state requirements (ARARs), and is cost effective. In addition, the remedial alternative satisfies the statutory preference for remedies that reduce the toxicity, mobility, or volume of hazardous substances.

Michael D. Sorel — 18 SEP 96

Michael D. Sorel — Date

BRAC Environmental Coordinator

Title

SECTION 1

INTRODUCTION

1.1 INTRODUCTION

Plattsburgh Air Force Base (PAFB) is undertaking a "time critical" removal action at Site SS-017 located at PAFB in Plattsburgh, New York (Figure 1.1). This removal action is being undertaken to remove volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) from soils above the groundwater table (i.e. the vadose zone soils) at the site. This removal action will also prevent further contamination of the local groundwater with VOCs and SVOCs emanating from the site soils.

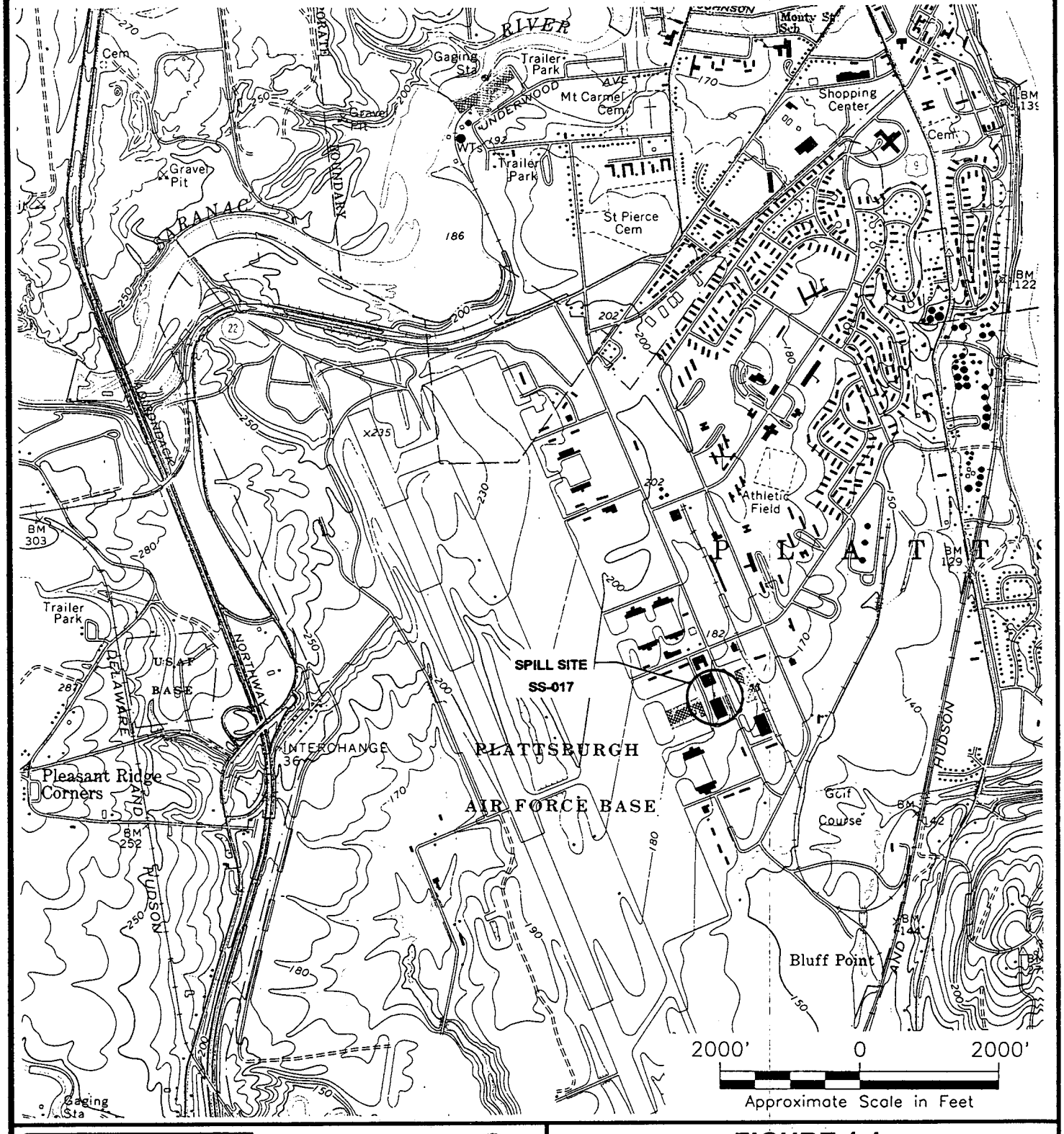
This Action Memorandum has been prepared to document the removal action proposed to address the vadose zone soil contamination. The proposed removal action includes soil vapor extraction (SVE) and bioventing to remove VOCs and SVOCs from the site soils. SVE will be implemented at all areas that were shown to contain TCE as well as other non-chlorinated petroleum hydrocarbons. Bioventing will be implemented in the areas that were shown to contain only non-chlorinated petroleum hydrocarbons.

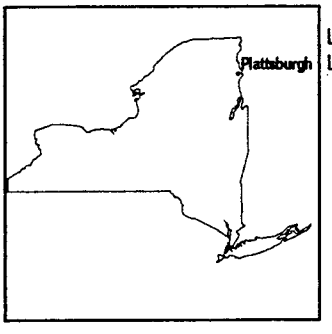
This document is presented in the format provided by the United States Environmental Protection Agency (USEPA) Action Memorandum Guidance Document, dated December, 1990.

1.2 SITE HISTORY

Site SS-017 was a former waste accumulation area located to the southeast of Building 2774 (Figure 1-2). This area was approximately 15 feet by 15 feet and consisted of a concrete pad used to store drums of waste and new product, including carbon remover solvent, PD-680 cleaning solvent, engine oil, and hydraulic fluid. Accidental spills during material transfers and leaking of drums are suspected to be the source of contamination. The release of contaminants was first discovered in 1985 during a routine New York State Department of Environmental Conservation (NYSDEC) inspection. Since that time all drums, debris, and the concrete pad have been removed from the site.

In April 1985, the NYSDEC performed a site inspection and limited soil investigation. The soil samples collected contained elevated levels of VOCs and SVOCs, specifically dichlorobenzenes. In response to this information, PAFB performed two additional soil investigations. These investigations were conducted in October 1985 and November 1986. Both sampling events detected elevated levels of VOCs. A Remedial Investigation (RI) and base line hydrogeologic investigation were conducted in 1994 to assess soil and groundwater contamination and to further characterize the physical setting of PAFB and the SS-017 site. In June and July 1996, a Supplemental Delineation Investigation was conducted to more completely delineate the area of vadose zone soil contamination. This investigation included the collection of 116 soil gas screening samples for analysis of VOCs. Based on the results of the soil gas samples, 80 subsurface soil samples were collected for analysis of VOCs (EPA Method 8020) and SVOCs (EPA Method 8270).





NEW YORK
QUADRANGLE LOCATION

LONGITUDE: N44° 38' 49"
LATITUDE: W73° 27' 17"

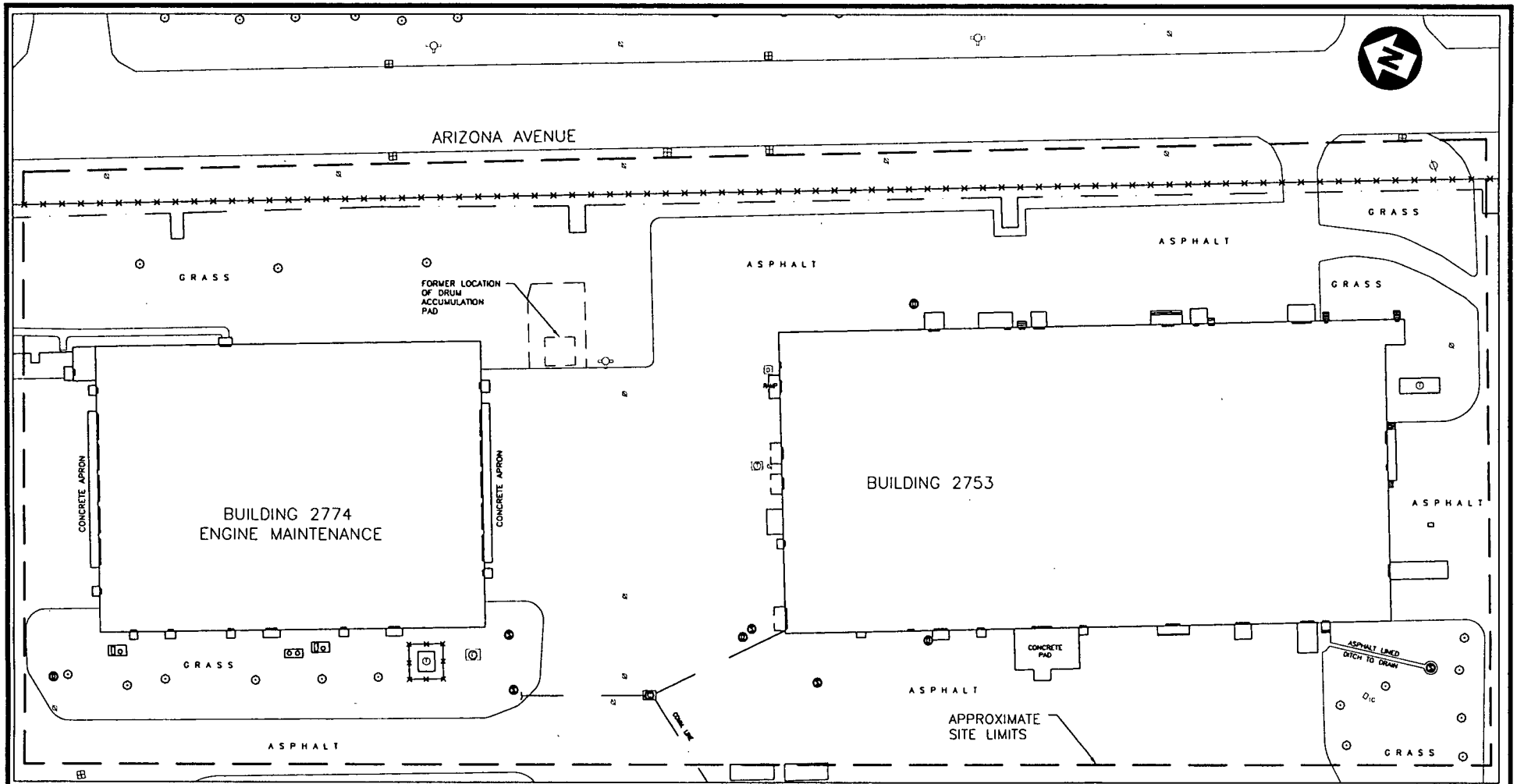
N

FIGURE 1.1

PLATTSBURGH AIR FORCE BASE
PLATTSBURGH, NEW YORK

SITE LOCATION MAP

PARSONS ENGINEERING SCIENCE, INC.



SOURCE: MALCOLM PIRNIE, INC.
FEBRUARY 1992

80' 40' 0 80'
Approximate Scale in Feet

DATE: 09/17/96 (SEH)
Xref.; NONE
H:\CAD\727307\27307G03.DWG (PS= 1/80XP PLOT= LAZERBW)

FIGURE 1-2

PLATTSBURGH AIR FORCE BASE
PLATTSBURGH, NEW YORK

SPILL SITE SS-017
SITE PLAN

PARSONS ENGINEERING SCIENCE, INC.
DESIGN • RESEARCH • PLANNING
290 ELWOOD DAVIS ROAD • SUITE 312 • LIVERPOOL, N.Y. 13088 • 315/451-9560
OFFICES IN PRINCIPAL CITIES

SECTION 2

PURPOSE

PAFB is undertaking a "time critical" Removal Action at Site SS-017 located at PAFB in Plattsburgh, New York, pursuant to the Federal Facilities Agreement (FFA) dated 12 September 1991. This is being undertaken as a component of the Department of Defense (DOD) Installation Restoration Program (IRP) and as a component of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 as amended by the 1986 Superfund Amendments and Reauthorization Act (SARA).

The purpose of this Action Memorandum is to document the proposed removal action described herein for the area south and southwest of Building 2774 designated as Site SS-017 at PAFB.

SECTION 3

SITE CONDITIONS AND BACKGROUND

3.1 SITE DESCRIPTION

3.1.1 Physical Location

PAFB is located in northeastern New York State, adjacent to Lake Champlain (Figure 3-1). It is approximately 26 miles from the Canadian border and 167 miles north of Albany, New York. The base is bordered on the north by the City of Plattsburgh and on the east by Lake Champlain. The base covers 4,795 acres, of which 3,365 acres are federally owned and controlled by the military, and 1,430 acres are registered as easement tracts. PAFB was officially closed by DOD on 30 September 1995, and responsibility for property reuse transferred to the Plattsburgh Airbase Redevelopment Corporation.

Site SS-017 is located in approximately the center of the base (Figure 3.2), southeast of Building 2774 and northeast of Building 2753. Buildings 2753 and 2774 (Figure 3-3) served as the industrial operations for the Strategic Air Command (SAC) flightline. These buildings are located just west of Arizona Avenue. The area surrounding the site is heavily developed for industrial use. The nearest off base residences are located approximately one mile due east of the site.

3.1.2 Site Evaluation

Spill Site SS-017 originally consisted of the grassy area at the southeast corner of Building 2774. Based on results of the Supplemental Delineation Investigation conducted in June and July 1996, the site was expanded to include the central and northern portion of the asphalt covered parking area between Buildings 2774 and 2753. Prior to 1992, the original site contained a concrete slab with dimensions of approximately 15 feet by 15 feet. The concrete slab, all drums, and surface debris have been removed from the site.

Previously, drums of waste and new product consisting of carbon remover solvent, PD-680 cleaning solvent (mineral spirits), engine oil, and hydraulic fluid were stored on the concrete slab. Waste drums were filled using funnels, and new product was obtained from drums fitted with spigots and stored on racks. As many as 15 to 20 drums may have been stored in this area at one time. (MPI, 1993). The potential sources of contamination include accidental spills from transfer of new product or waste material, and spillage resulting from filling waste drums.

In April 1985, the NYSDEC collected two grab surface soil samples adjacent to the concrete slab. These samples showed elevated levels of VOCs including total dichlorobenzenes detected at a maximum concentration of 9,800,000 parts per billion (ppb). In response to this information, PAFB performed two additional soil investigations. The investigations were conducted in October 1985 and November 1986. Both sampling events detected elevated levels of VOCs. An RI and basewide

hydrogeologic investigation were conducted in 1994 to assess soil and groundwater contamination, and to further characterize the physical setting of the PAFB ("Remedial Investigation Report, Attachment 1 Sites," PAFB, September 1994). In June and July 1996, a Supplemental Delineation Investigation was conducted at the site to more completely assess the area of vadose zone contamination. One hundred and 16 soil gas survey samples were collected for VOC analysis. Based on the results of the soil gas samples, 80 subsurface soil samples were collected for analysis of VOCs and SVOCs. A summary of the results from the 1994 RI Report and the supplemental investigation are discussed below.

3.1.3 Site Characteristics

3.1.3.1 Physical Features

The topography in the vicinity of Building 2774 is relatively flat. The elevation ranges from approximately 170 to 180 feet above mean sea level (MSL). Paved surfaces are present to the north and south sides of Building 2774, and grassy areas exist to the east and west. Surface water reportedly drains to the culvert located southeast of Building 2774 and discharges to a drainage ditch on the eastern side of Arizona Avenue.

3.1.3.2 Site Stratigraphy

Stratigraphy in the area of Site SS-017 consists of four generalized geologic units. These units consist of two unconsolidated, stratified layers consisting of sand/silty sand, and silt and clay which overlie glacial till and bedrock. The depth, thickness, and descriptions of the unconsolidated deposits vary slightly across the SS-017 site. Each of these units is described below. A geologic cross section of the site is shown on Figure 3-4.

Sand/Gravel

This unit is characterized as generally fine to medium size sand with occasional layers of coarser sand, silt, and gravel. The sand unit typically becomes finer-grained with depth. The thickness of the sand unit is approximately 24 feet.

Silt and Clay

This unit is characterized as a gray, very stiff, layered silt and clay. The clay has a medium to high plasticity. Silt and clay content and plasticity generally increase with depth. The silt and clay unit is found between 32 and 35 feet below ground surface (bgs). The borings and monitoring wells installed at Site SS-017 do not penetrate this layer. However, based on previous investigations at PAFB, its thickness is estimated to range from 10 to 15 feet in the vicinity of Site SS-017.

Glacial Till

The glacial till consists of two major types: sandy till and clayey till. Both units consist of poorly sorted sand, silt, clay, gravel and boulder material. This layer is considered a leaky confining unit due to the presence of fractures and joints. The glacial till layer was encountered at a depth of approximately 45 feet below ground surface, based on data from piezometer boring PZ-11D installed by Malcolm Pirnie in 1993 (MPI, 1993). The thickness of the glacial till ranges from 0 to 24 feet.

Bedrock

The underlying bedrock consists of thin- to thick-bedded limestone and dolostones with interbedded layers of sandstone and shale. The depth to bedrock at Site SS-017 is estimated to be 60 feet bgs. This depth was estimated from deep wells and geophysical surveys conducted by Malcolm Pirnie (MPI, 1993) and by ABB Environmental Services, Inc., during the FT-002 RI.

3.1.3.3 Hydrogeology

The regional hydrogeology in the Plattsburgh area is dominated by infiltration and runoff from the Adirondack Mountains to the west. The regional discharge is to Lake Champlain to the east.

Three distinct hydrogeological units were found in SS-017 study area: a shallow sand aquifer, a silt, clay and glacial till unit, and a bedrock aquifer unit. Shallow groundwater is present in SS-017 area at a depth of 4 to 8 feet below ground surface. The direction of groundwater flow is east-southeast with a horizontal gradient of 0.013 foot per foot.

3.1.4 Release or Threatened Release of a Hazardous Substance

3.1.4.1 Previous Sampling Results

All Pre-Site Investigation Pre-SI) and Site Investigation (SI) work was conducted by other contractors. This section summarizes the information available from those previous efforts. The complete Pre-SI and SI reports are available in the Information Repository.

3.1.4.1.1 Surface Soils

In April 1985, the NYSDEC collected two surface soil samples (004-01 and 004-02) and reported total dichlorobenzene concentrations as high as 9,800,000 μg/kg and aromatic hydrocarbon concentrations as high as 640,000 μg/kg (total xylenes). A summary of the analytical results for these two samples is presented in Table 3-1.

3.1.4.1.2 Subsurface Soils

Following the NYSDEC surface soil sampling event, PAFB collected soil samples from 4-, 12-, 18- and 24- inches bgs and analyzed for oil and grease, as well as chlorobenzenes and dichlorobenzenes (Table 3-1). The approximate sample locations are shown on Figure 3-5. Although the sample locations were not well documented, the data indicates elevated levels of contaminants at all depths sampled. Maximum contamination levels were collected in location SP-1 (oil and grease, and total dichlorobenzene levels were as high as 59,800 μg/kg and 23,600,000 μg/kg, respectively).

A soil gas survey was performed within the site area during the site investigation (SI) (October 1987). Sample locations are shown in Figure 3-6 and the analytical results are presented in Table 3-2. These data indicate that the elevated VOC levels are found in the immediate vicinity of the hazardous waste accumulation pad located southeast of Building 2774.

As shown in Table 3-2, of the 28 soil gas samples collected, 14 detected trichloroethene (TCE) at a concentration above 100 ng/l. Sample number SP 13-9 detected the highest TCE concentration at 17,416 ng/l. In addition, trichloroethane was detected in four samples above 100 ng/l and tetrachloroethene (PCE) was detected in the majority of the samples at concentrations below 100 ng/l. Benzene, toluene, and xylenes were generally detected below 2 μg/l except at locations SP 13-3 and SP 13-7 where total benzene, toluene, and xylenes were detected at 877 μg/l and 8 μg/l, respectively.

Four soil borings were drilled during November of 1987 to a depth of five to six feet bgs and sampled during the SI field work. The SI analytical data are presented in Table 3-3 and the sample locations are shown on Figure 3-5. The samples were collected from various depths and analyzed for some or all of the following parameters: VOCs, SVOCs, Target Analyte List (TAL) inorganics, and petroleum hydrocarbons (PHCs).

The highest levels of organic contaminants were measured in soil boring B-17-001 with halogenated and aromatic hydrocarbon levels as high as 6,600 μg/kg (TCE) and 72,000 μg/kg (total xylenes), respectively. Elevated levels of SVOCs were also detected in soil boring B-17-001 at a concentration of 41,000 μg/kg (1,2-dichlorobenzene). These samples were collected from three to four feet bgs. A soil sample from boring B-17-001 collected at five feet bgs had a VOC concentration of 390 μg/kg total xylenes. This concentration was significantly lower than the samples from the three and four foot bgs depth range.

Elevated levels of PHCs and lead (18,000 mg/kg and 98 mg/kg, respectively) and low levels of aromatic hydrocarbons at the one foot sample depth were detected in soil boring B-17-002. Soil samples collected from B-17-003 and B-17-004 also contained elevated levels of PHCs and lead (10,000 mg/kg and 163 mg/kg, respectively) at the one foot sample depth. Low levels of VOCs and bis(2-ethylhexyl)phthalate were also measured in these soil samples.

A Supplemental Delineation Investigation was performed by OHM and Parsons Engineering Science, Inc. (Parsons ES), in June and July 1996. Soil gas screening samples were collected from the area surrounding site SS-017 for analysis of selected VOCs by a field gas chromatograph (GC). Based on the results of the soil gas samples, 80 subsurface soil samples were collected via a Geoprobe® for analysis of VOCs (EPA Method 8020) and SVOCs (EPA Method 8270). The soil gas survey results for selected analytical parameters are presented on Figure 3-7, and the full analytical results are presented in Table 3-4. The soil sample results for selected analytical parameters are shown on Figure 3-8, and all NYSDEC TAGM HWR-94-4046 exceedances are presented in Table 3-5.

During the soil gas survey, 116 samples were collected for on-site GC analysis of TCE, PCE, 1,2-, 1,3-, and 1,4-dichlorobenzene, and the BTEX compounds. Analytical results showed total VOC levels ranging from non-detect to over 2,000,000 ppb. TCE, detected in 70 of 116 soil gas samples, was the most common compound detected. Concentrations in these 70 samples ranges from a low of 21 ppb to a maximum observed concentration of 1,637,000 ppb at sample point J-6. PCE was the

second most common compound detected (34 detections), and ranged from 233 ppb to 47,400 ppb at sample point I-5. BTEX compounds were detected at 15 sample points. BTEX concentrations ranged from 50 ppb to over 1,050,000 ppb. The highest BTEX concentration was found at sample point I-6. DCBs were detected at 12 locations at concentrations ranging from 456 to 459,300 ppb. The highest DCB concentration was observed at sample point J-6.

Each of the 116 soil gas sample points, along with an additional 43 field screening points, were also screened for methane, carbon dioxide (CO_2), oxygen (O_2), and total VOCs. The additional field screening points were a combination of multi-depth readings at the same locations along with additional field sampling points. Sample points with the highest concentrations of VOCs reported during the GC analysis also had low O_2 and CO_2 levels. For example, sample point I-5 showed BTEX at 255,017 ppb, TCE at 82,609 ppb, and PCE at 47,500 ppb, while the O_2 and CO_2 concentrations were 0.3% and 17.1%, respectively. This correlation was also indicated at sample points H-5, H-5-1, I-6, and J-6, and other sample locations in the central parking lot area. Total VOC concentrations at the referenced sample points ranged from 385,129 ppb at I-5 to 2,945,700 ppb at J-6, while O_2 and CO_2 concentrations ranged from 0 to 0.3% and 17.1 to 19.7%, respectively. It is interesting to note that methane was detected in only four field screening locations. These locations were H-5 (2.3%), I-5 (0.1%), I-6 (3%), and J-6 (29.4%).

A "halo effect" was also noted around the areas of highest soil contamination based on the field screening of O_2 and CO_2 concentrations. That is, sample points with low or non-detectable levels of total VOCs located adjacent to areas of high VOC concentrations, such as H-4 (ND), I-4 (ND), and I-7 (636 ppb PCE) also had low O_2 and CO_2 concentrations. Field screening at sample points H-4 showed O_2 at 3% and CO_2 at 15.5%. At I-4, O_2 was at 6.2%, and CO_2 at 12.1%. At I-7, O_2 was at 3.7%, and CO_2 was at 13.4%. This is likely due to the diffusion of O_2 and CO_2 from the surrounding areas into the areas of higher soil contamination to support biological growth feeding on the soil contaminants.

Analytical results of the soil samples indicated localized soil contamination in five general areas near site SS-017. The largest area of TCE containing soil was identified between Buildings 2774 and 2753. A second large area of TCE containing soil was identified on the east side of Building 2753. A third relatively small and isolated area of TCE containing soil was identified immediately north of Building 2774. Two other areas of soil contaminated with non-chlorinated petroleum hydrocarbons were identified near the southeast corner of Building 2774 and near the northeast corner of Building 2753.

Soil contamination in the two larger areas of the site consists of various VOCs including TCE, benzene, xylenes, 1,2-dichlorobenzene, and methylene chloride. The maximum level of TCE was 6,730 μg/kg at sample location 17-SS-32. The maximum levels of benzene, total xylenes, and 1,2-dichlorobenzene were 7,180 μg/kg, 81,600 μg/kg, and 38,100 μg/kg respectively, at sample location J-6 from a depth of two feet. Methylene chloride was detected at a concentration of 6,710 μg/kg as sample location 17-SS-07.

Additionally, some limited SVOCs were detected in the main area. Detected SVOCs included napthalene, benzo(a)anthracene, and benzo(a)pyrene. The highest napthalene concentration was 25,000 μg/kg at sample location 17-SS-07, while benzo(a)anthracene and benzo(a)pyrene were found at levels of 290 μg/kg and 241 μg/kg, respectively, at sample location 17-SS-17.

TCE was the only compound detected above TAGM levels in the small area located immediately north of Building 2774. TCE was indicated at a concentration of 17.4 μg/kg in a soil sample from this area.

3.1.4.1.3 Groundwater

Three monitoring wells (MW-17-001 through MW-17-003) were installed and sampled at the site during the SI field activities. The well locations are shown on Figure 3-9. MW-17-001 is screened near the water table and is located upgradient of the site. This location was used to obtain background groundwater values. MW-17-002 and MW-17-003 are screened at successive ten foot intervals below the water table forming a well pair. The groundwater samples from these wells were analyzed for VOCs, SVOCs, and TAL inorganics. The results are summarized in Table 3-6. As shown in this table, no VOCs were detected in the background well (MW-17-001) and metals were detected at background levels (SI, 1989). The groundwater sample obtained from MW-17-002 contained aromatic hydrocarbon concentrations up to 20 μg/L and contained individual PAHs up to 11 μg/L. Trace concentrations of TCE (estimated value of 4.1 μg/L) were measured in the groundwater sample obtained from MW-17-003. The SI also reported that the metal values in the downgradient samples were at background levels (i.e. as compared to levels measured in monitoring well MW-17-001).

3.1.4.2 Current Status

The original sources of contamination (i.e. drums of waste and new product) have been removed from this area. This area will no longer be used for waste and product storage and handling due to the closed status of the base. The main concern at this time is the secondary source of contamination, i.e. the contaminated soil above the groundwater. As discussed above, sampling has confirmed the presence of organic contaminants in the soil located at SS-017. Based on the available information, significantly elevated levels of organic contaminants have not been detected in the groundwater. However, the proposed interim removal action will be implemented to protect the groundwater from potential future contamination due to soil contamination above the groundwater table.

3.1.5 NPL Status

PAFB is listed on the National Priorities List (NPL) as of November, 1989. Multiple locations within the base are of concern, including Site SS-017. The proposed remedial action discussed in this Action Memorandum addresses the immediate environmental risks associated with previous spills at Site SS-017.

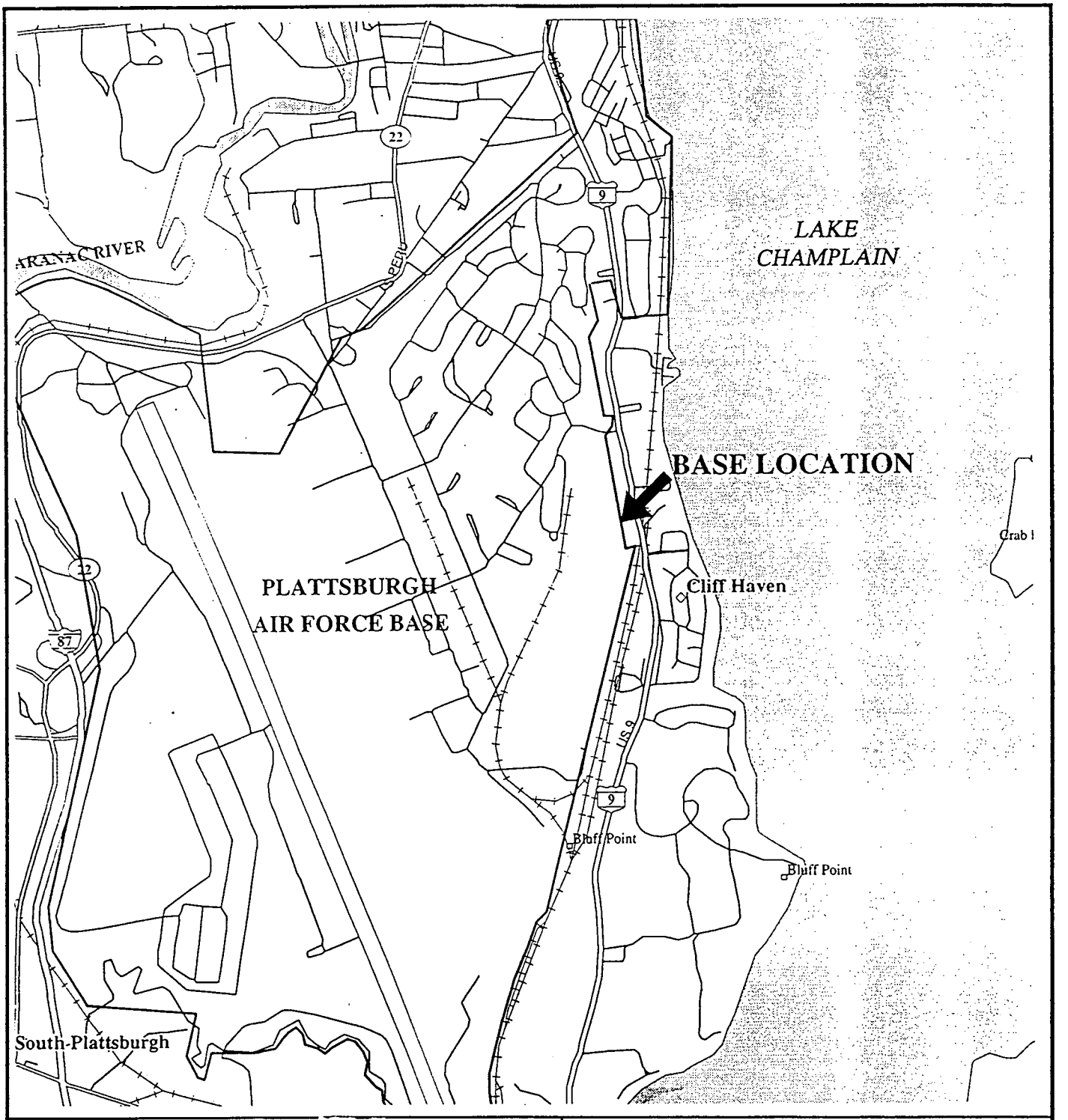
3.2 OTHER ACTIONS TO DATE

Based on data from two investigations, PAFB conducted a Removal Action at the site in the Fall of 1992. During this action, approximately 200 cubic yards of contaminated soil from beneath and around the concrete slab was excavated and incinerated at an off-site permitted treatment, storage and disposal (TSD) facility. The concrete pad was landfilled at a permitted TSD. Soils were excavated from a 30- by 45-foot area (Figure 3-10) to a maximum depth of approximately four feet bgs, which was the depth of the groundwater table during the removal action. During excavation, soils were monitored with a photoionization detector (PID). Following the completion of the excavation, PID readings taken in the excavated pits indicated significant residual contamination remaining below the bottom of the excavation.

3.3 FEDERAL, STATE, AND LOCAL ACTION TO DATE

The release of contaminants was first discovered in 1985 during a routine NYSDEC inspection. Since that time all of the drums and debris have been removed from the site and additional field investigations have been conducted including an SI in 1987. There has been an exchange of correspondence between PAFB and the NYSDEC since the discovery of the problem.

The Air Force informed the USEPA and the NYSDEC during the August 1996 BRAC Cleanup Team (BCT) Meeting of their intention to perform a source control removal action at Spill Site SS-017. Receipt of this Action Memorandum starts the clock for this time critical removal action.



LATITUDE: N44°39'49"
LONGITUDE: W73°27'45"

NEW YORK
QUADRANGLE LOCATION

Scale 1:31,250 (at center)

2000 Feet

1000 Meters

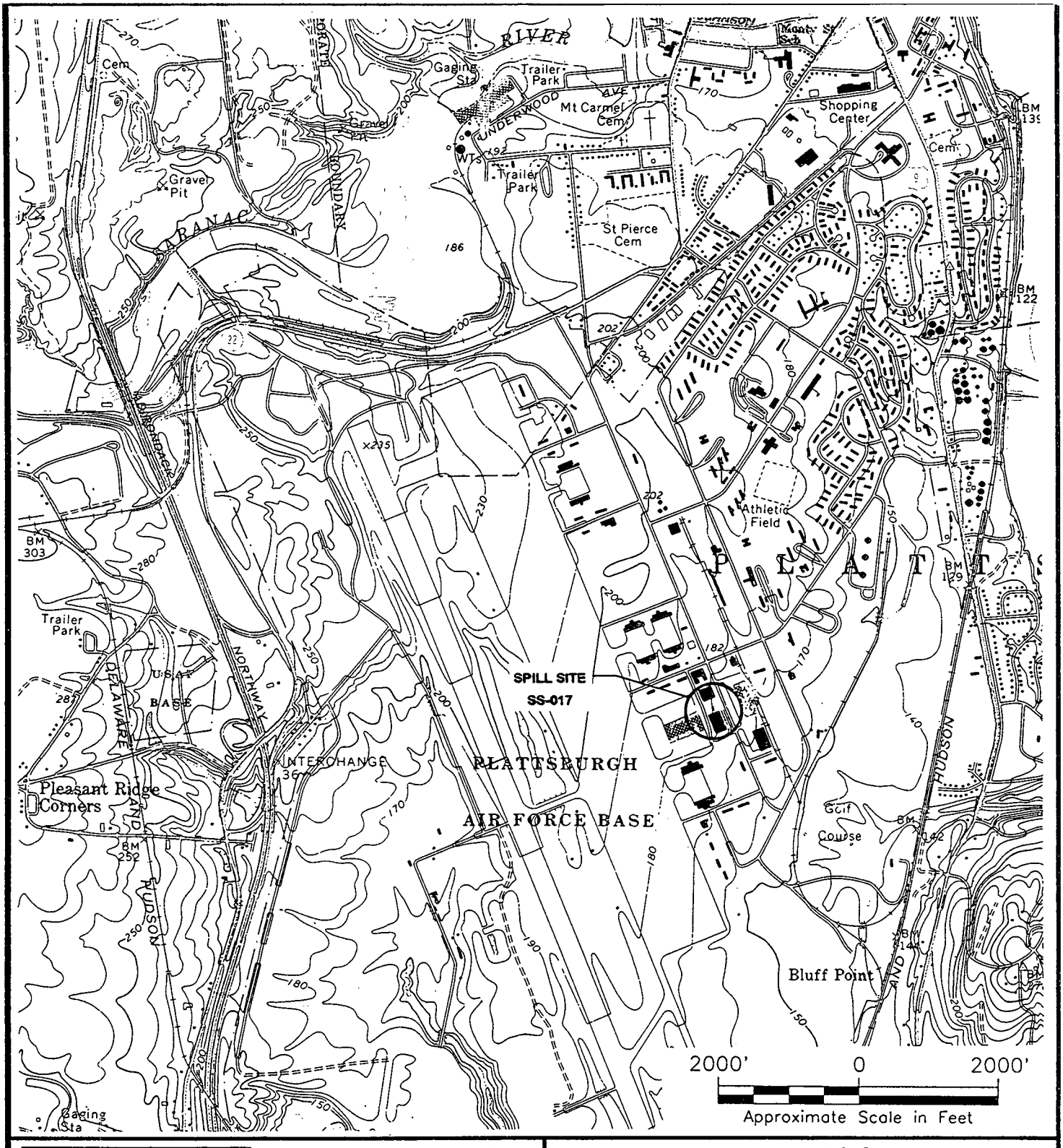
DATE: 10/10/95 (SEH)
727307.06100\BOARD.DWG

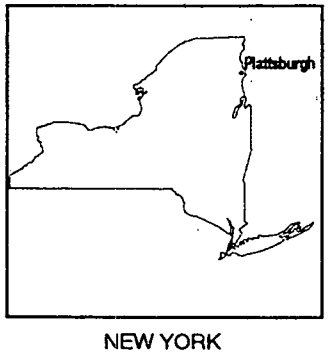
FIGURE 3-1

PLATTSBURGH AIR FORCE BASE
PLATTSBURGH, NEW YORK

BASE LOCATION MAP

PARSONS ENGINEERING SCIENCE, INC.
DESIGN • RESEARCH • PLANNING
290 ELWOOD DAVIS ROAD • SUITE 312 • LIVERPOOL, N.Y. 13088 • 315/451-9560
OFFICES IN PRINCIPAL CITIES





NEW YORK
QUADRANGLE LOCATION

LONGITUDE: N44° 38' 49"
LATITUDE: W73° 27' 17"

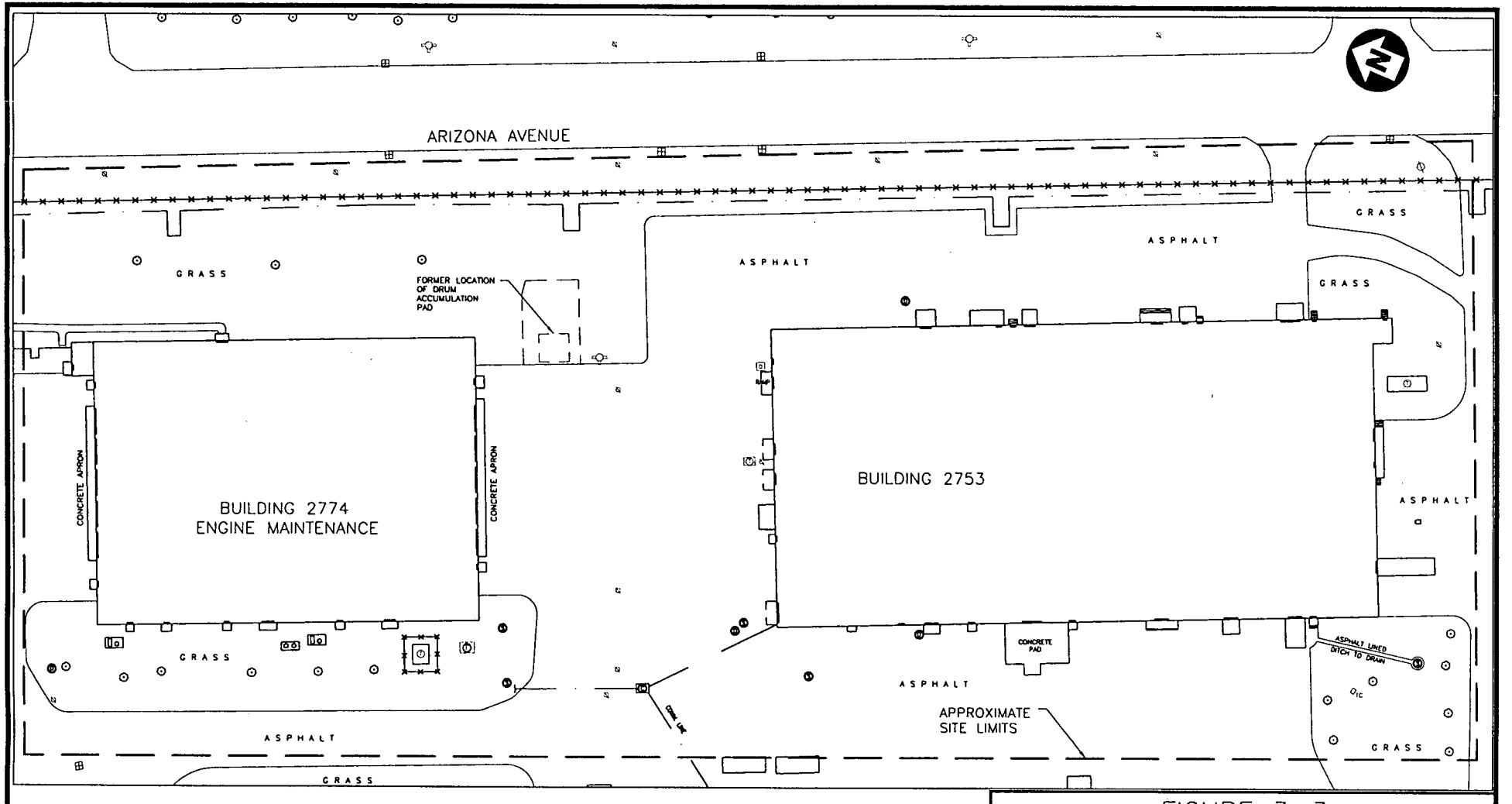
N

FIGURE 3.2

PLATTSBURGH AIR FORCE BASE
PLATTSBURGH, NEW YORK

SITE LOCATION MAP

PARSONS ENGINEERING SCIENCE, INC.



SOURCE: MALCOLM PIRNIE, INC.
FEBRUARY 1992

80' 40' 0 80'
Approximate Scale in Feet

DATE: 09/17/96 (SEH)
Xref: NONE
H:\CAD\727307\SS-017\27307G04.DWG (PS= 1/80XP PLOT= LAZERBW)

FIGURE 3-3

PLATTSBURGH AIR FORCE BASE
PLATTSBURGH, NEW YORK

SPILL SITE SS-017
SITE PLAN

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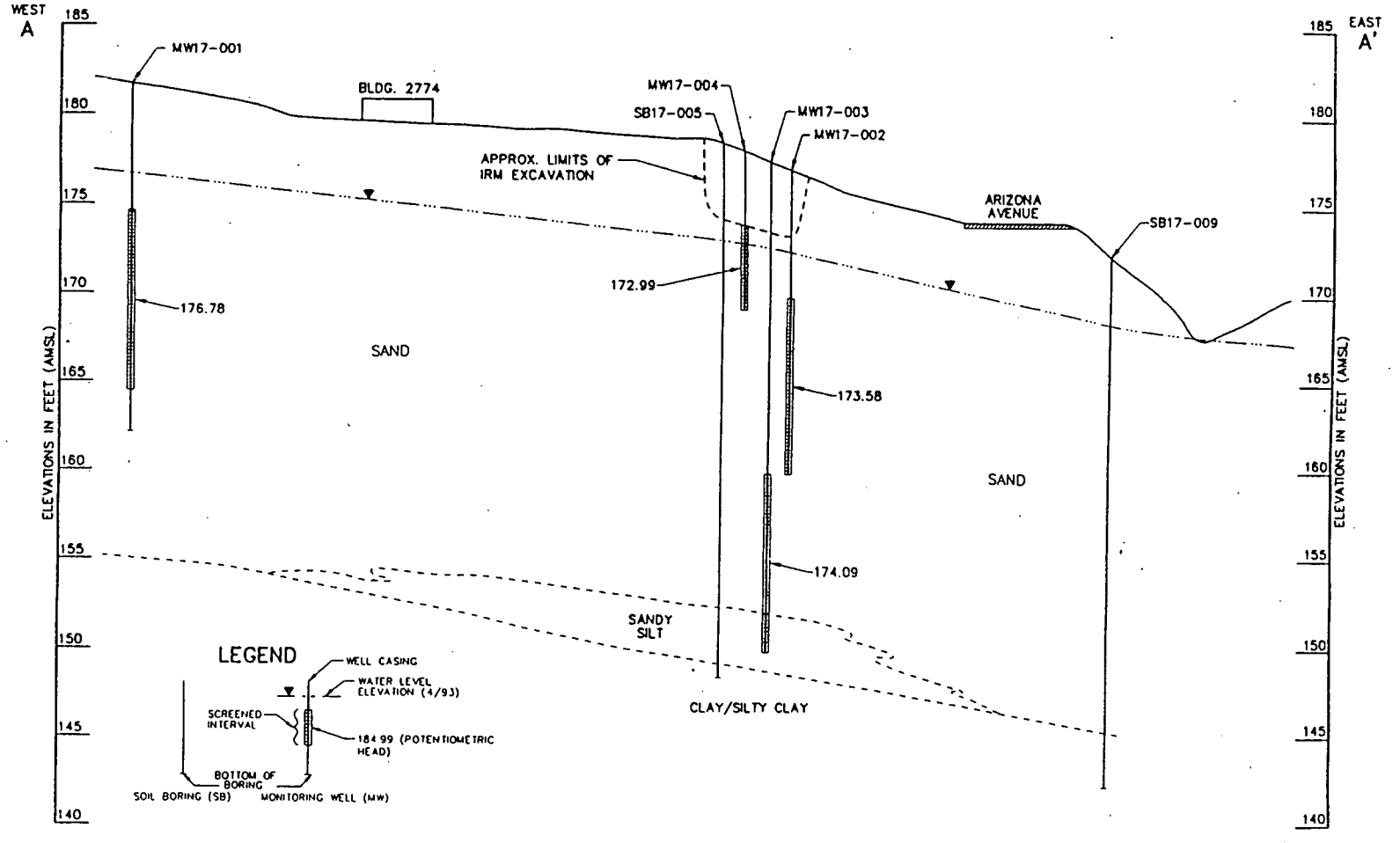

SOURCE: MALCOLM PIRNIE, INC.

NOT TO SCALE

DATE: XX/XX/XX
DATE: XX/XX/XX
H:\CAD\DIRECTOR\FILENAME.DWG (MODEL/PAPER SPACE)

FIGURE 3-4

PLATTSBURGH AIR FORCE BASE
PLATTSBURGH, NEW YORK

SPILL SITE SS-017
GENERALIZED HYDROGEOLOGIC SECTION

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NOTES:

1. THE PLOTTED SAMPLE LOCATIONS 004-01 AND 004-02 HAVE BEEN APPROXIMATED BASED ON CONVERSATIONS BETWEEN PAFB AND THE N.Y.S. D.E.C.

2. THE SOLID SQUARE BOX REPRESENTS THE CONCRETE PAD AS SHOWN IN THE SAMPLING REPORT FOR THE OCT. 1985 SAMPLING EVENT CONDUCTED BY THE PLATTSBURGH AIR FORCE BASE (PAFB). THE REPORT IMPLIES THAT THE DIMENSIONS AND LOCATION OF THE PAD WERE MEASURED IN THE FIELD WITH A TAPE MEASURE AND REFERENCED TO BUILDING 2774.

3. THE PLOTTED SAMPLE LOCATIONS FOR SP-1 THROUGH SP-8 ARE BASED ON THE SAMPLING REPORT FOR THE OCT. 1985 SAMPLING EVENT CONDUCTED BY THE PAFB. THE REPORT IMPLIES THAT THE SAMPLE LOCATIONS WERE MEASURED IN THE FIELD WITH A TAPE MEASURE AND REFERENCED TO BUILDING 2774.

4. THE DASHED SQUARE BOX REPRESENTS THE CONCRETE PAD AS SHOWN ON THE TOPOGRAPHIC BASE MAP OF THE SITE PROVIDED BY PAFB.

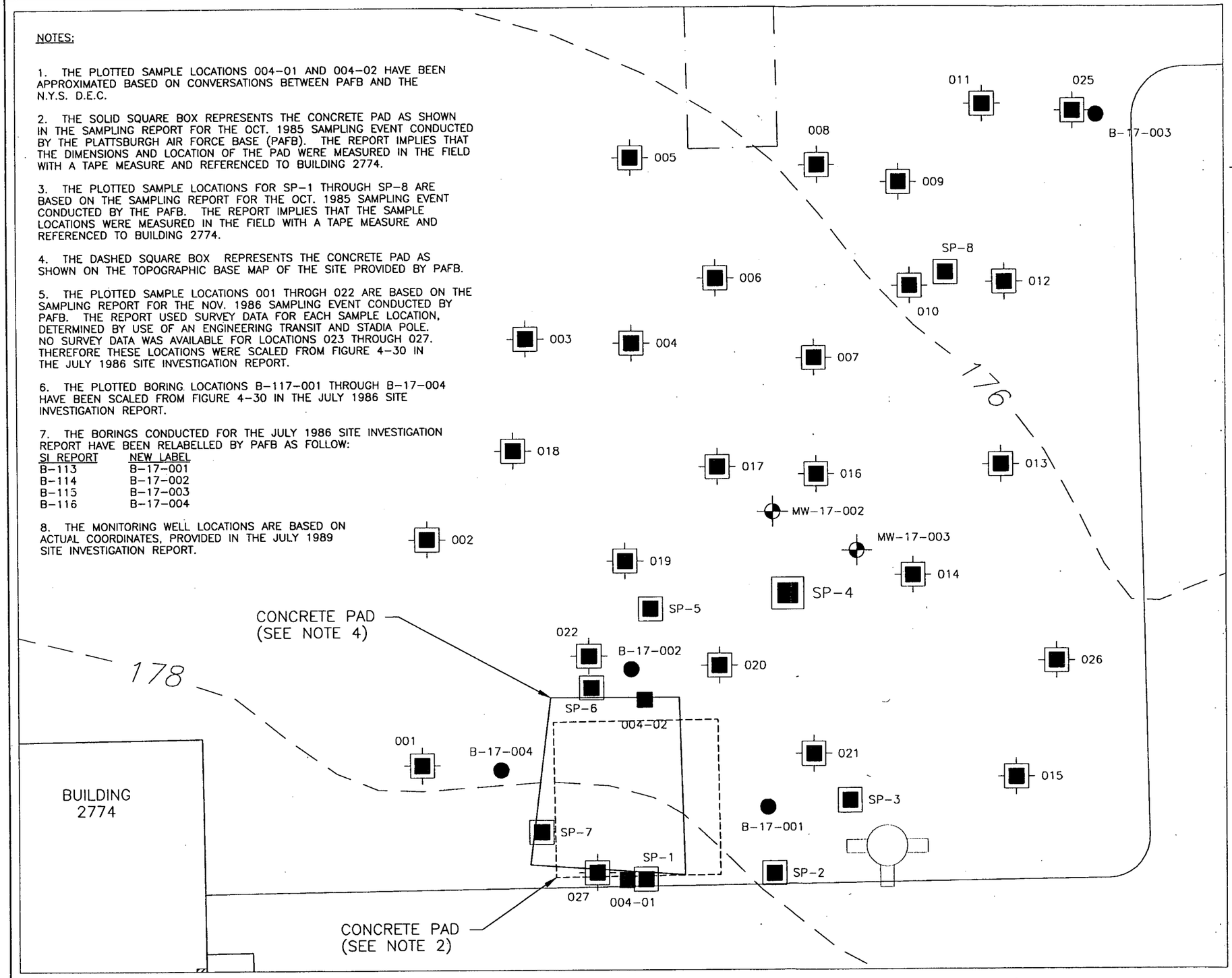
5. THE PLOTTED SAMPLE LOCATIONS 001 THROGH 022 ARE BASED ON THE SAMPLING REPORT FOR THE NOV. 1986 SAMPLING EVENT CONDUCTED BY PAFB. THE REPORT USED SURVEY DATA FOR EACH SAMPLE LOCATION, DETERMINED BY USE OF AN ENGINEERING TRANSIT AND STADIA POLE. NO SURVEY DATA WAS AVAILABLE FOR LOCATIONS 023 THROUGH 027. THEREFORE THESE LOCATIONS WERE SCALED FROM FIGURE 4-30 IN THE JULY 1986 SITE INVESTIGATION REPORT.

6. THE PLOTTED BORING LOCATIONS B-117-001 THROUGH B-17-004 HAVE BEEN SCALED FROM FIGURE 4-30 IN THE JULY 1986 SITE INVESTIGATION REPORT.

7. THE BORINGS CONDUCTED FOR THE JULY 1986 SITE INVESTIGATION REPORT HAVE BEEN RELABELLED BY PAFB AS FOLLOW:

SI REPORT	NEW LABEL
B-113	B-17-001
B-114	B-17-002
B-115	B-17-003
B-116	B-17-004

8. THE MONITORING WELL LOCATIONS ARE BASED ON ACTUAL COORDINATES, PROVIDED IN THE JULY 1989 SITE INVESTIGATION REPORT.



LEGEND:

004-01	SOIL SAMPLING LOCATIONS NY STATE DEC, APRIL 1985 (LOCATIONS APPROX. SEE NOTE 1)
SP-1	SOIL SAMPLING LOCATIONS, PLATTSBURGH AFB OCT. 1985 (SEE NOTE 3)
001	SOIL SAMPLING LOCATIONS PLATTSBURGH AFB NOV. 1986 (SEE NOTE 5)
B-17-001	SOIL BORING LOCATIONS, E.C. JORDAN NOV. 1987 (SEE NOTE 6)
MW-17-002	MONITORING WELL LOCATIONS, E.C. JORDAN NOV. 1987 (SEE NOTE 8)
176	TOPOGRAPHIC CONTOUR LINE

10' 5' 0 10'
Approximate Scale in Feet

SOURCE: MALCOLM PIRNIE, INC. FEBRUARY 1992

FIGURE 3-5

PLATTSBURGH AIR FORCE BASE
PLATTSBURGH, NEW YORK

SPILL SITE SS-017
APPROXIMATE SAMPLE LOCATIONS

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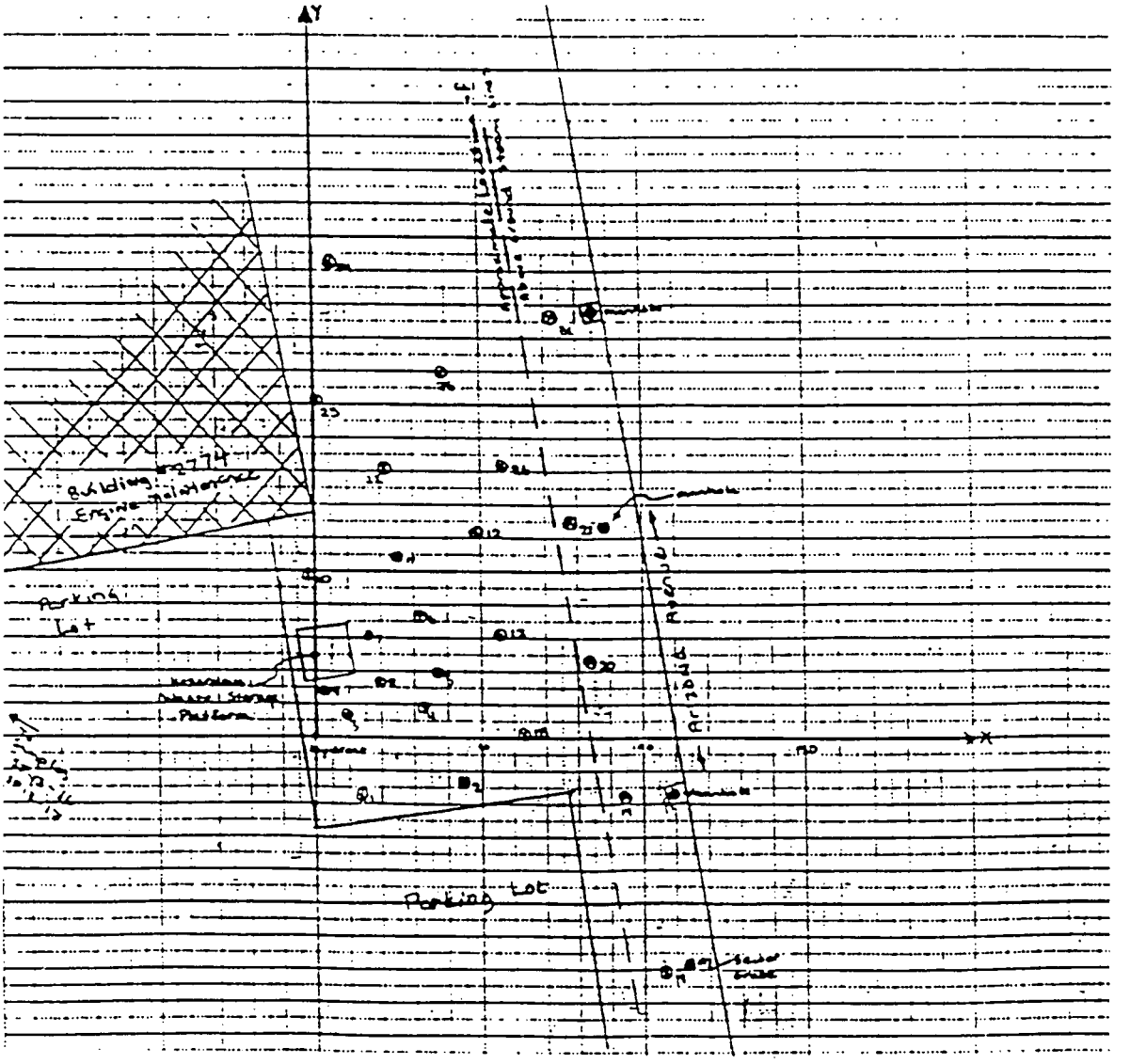
DATE: 09/12/96 (SEH)
Xref: NONE
H:\CAD\727307\SS-017\27307G01.DWG (PSPACE= 1/10XP PLOT= CALBW)



SOURCE: E.C. JORDAN CO.

NOT TO SCALE

FIGURE 3-6

PLATTSBURGH AIR FORCE BASE
PLATTSBURGH, NEW YORK

SPILL SITE SS-017
APPROXIMATE SOIL GAS SURVEY LOCATIONS

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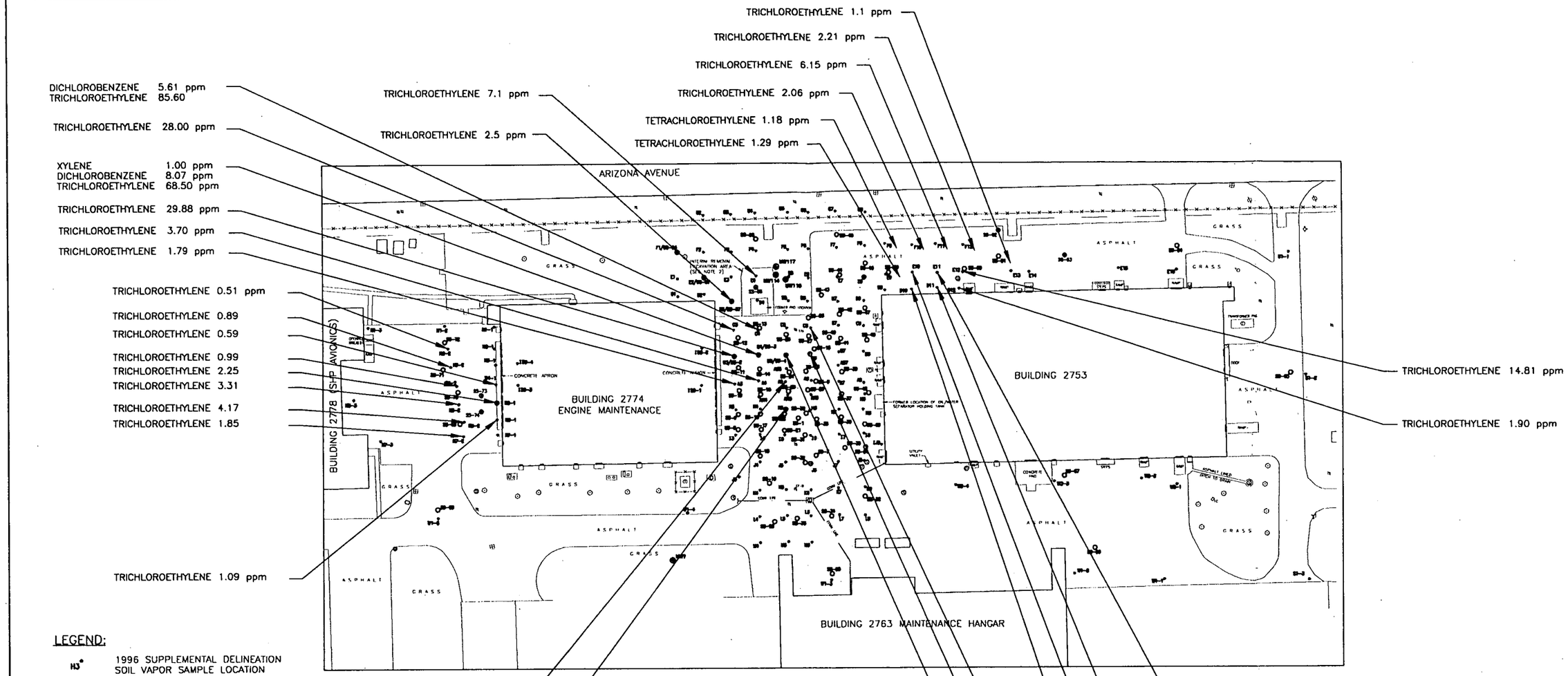
DATE: XX/XX/XX
DATE: XX/XX/XX
H:\CAD\DIRECTOR\FILENAME.DWG (MODEL/PAPER SPACE)



LEGEND:

- H5 — 1996 SUPPLEMENTAL DELINEATION SOIL VAPOR SAMPLE LOCATION
- SS-11 — 1996 SUPPLEMENTAL DELINEATION SOIL SAMPLE LOCATION
- B4/SS-3 — SOIL VAPOR/SOIL SAMPLE LOCATION
- SB-58 — SOIL BORING LOCATION
- MW114 — MONITORING WELL LOCATION
- FIRE HYDRANT LOCATION
- UTILITY POLE
- STORM DRAIN
- SEWER MANHOLE
- TRANSFORMER
- COMMUNICATION LINES
- DOOR

NOTE:
ALL SAMPLE RESULTS ARE IN PARTS PER MILLION (ppm)

SOURCE: OHM REMEDIATION SERVICES CORP.
PROJECT No. 17257
DRAWING No. 17257-D5

DATE: 09/12/96 (SEH)
Xref: 17257-D5.DWG
H:\CAD\727307\SS-017\27307G05.DWG (PSPACE= VARIES PLOT= CALBW)

FIGURE 3-7

PLATTSBURGH AIR FORCE BASE
PLATTSBURGH, NEW YORK

SPILL SITE SS-017
SUPPLEMENTAL DELINEATION
SOIL GAS SCREENING SURVEY RESULTS

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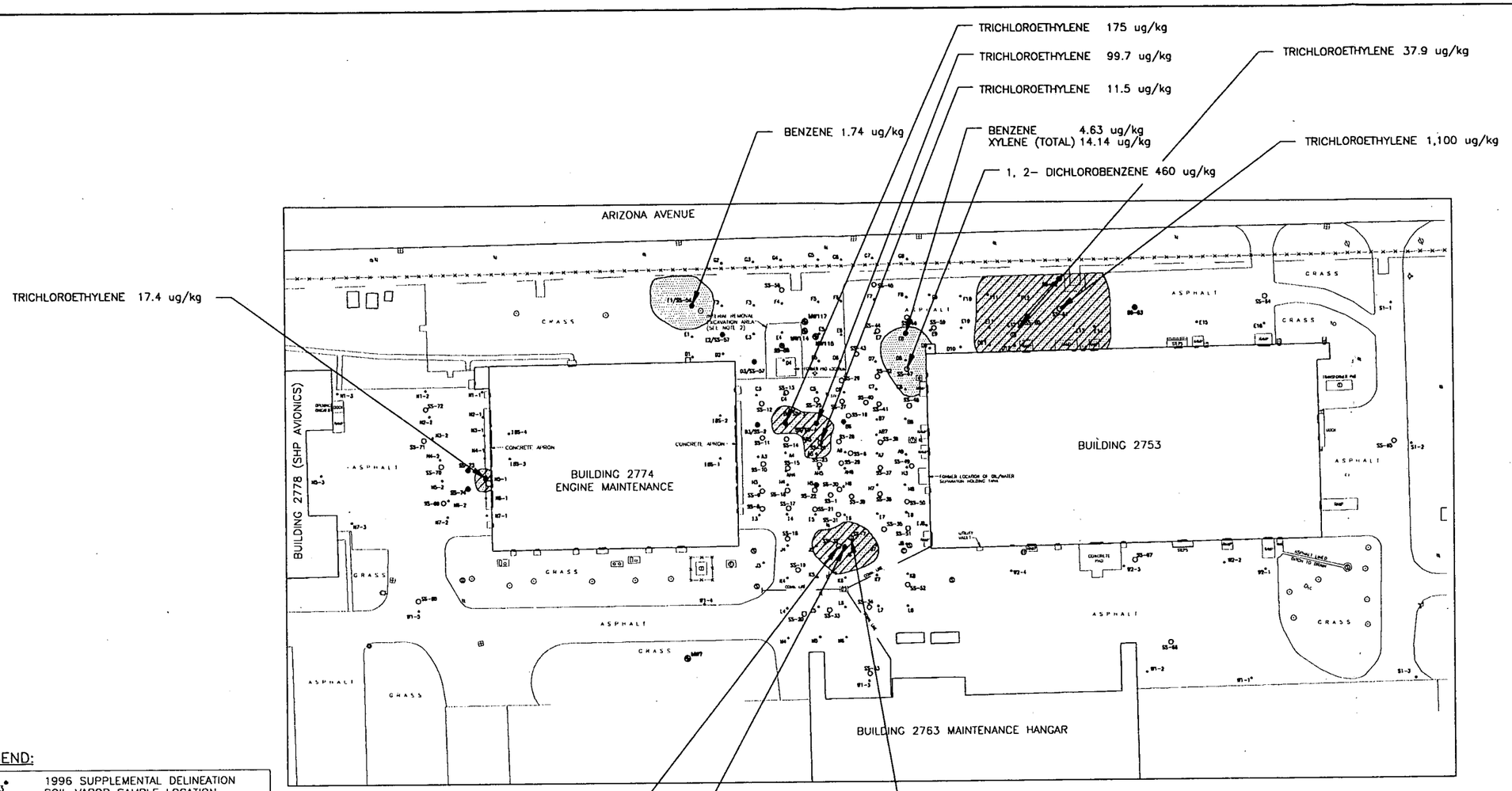
OFFICES IN PRINCIPAL CITIES



LEGEND:

- 1996 SUPPLEMENTAL DELINEATION SOIL VAPOR SAMPLE LOCATION
- 1996 SUPPLEMENTAL DELINEATION SOIL SAMPLE LOCATION
- SOIL VAPOR/SOIL SAMPLE LOCATION
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- FIRE HYDRANT LOCATION
- UTILITY POLE
- STORM DRAIN
- SEWER MANHOLE
- TRANSFORMER
- COMMUNICATION LINES
- DOOR
- SOIL AREA TO BE REMEDIATED BY BIOVENTING
- SOIL AREA TO REMEDIATED BY SOIL VAPOR EXTRACTION

100' 50' 0 100'

Approximate Scale in Feet

SOURCE: OHM REMEDIATION SERVICES CORP.
PROJECT No. 17257
DRAWING No. 17257-D5

DATE: 09/12/96 (SEH)
Xref: 17257-D5.DWG
H:\CAD\727307\SS-017\27307G06.DWG (PSPACE= VARIES PLOT= CALBW)

FIGURE 3-8

PLATTSBURGH AIR FORCE BASE
PLATTSBURGH, NEW YORK

SPILL SITE SS-017
SUPPLEMENTAL DELINEATION
SOIL SAMPLE RESULTS

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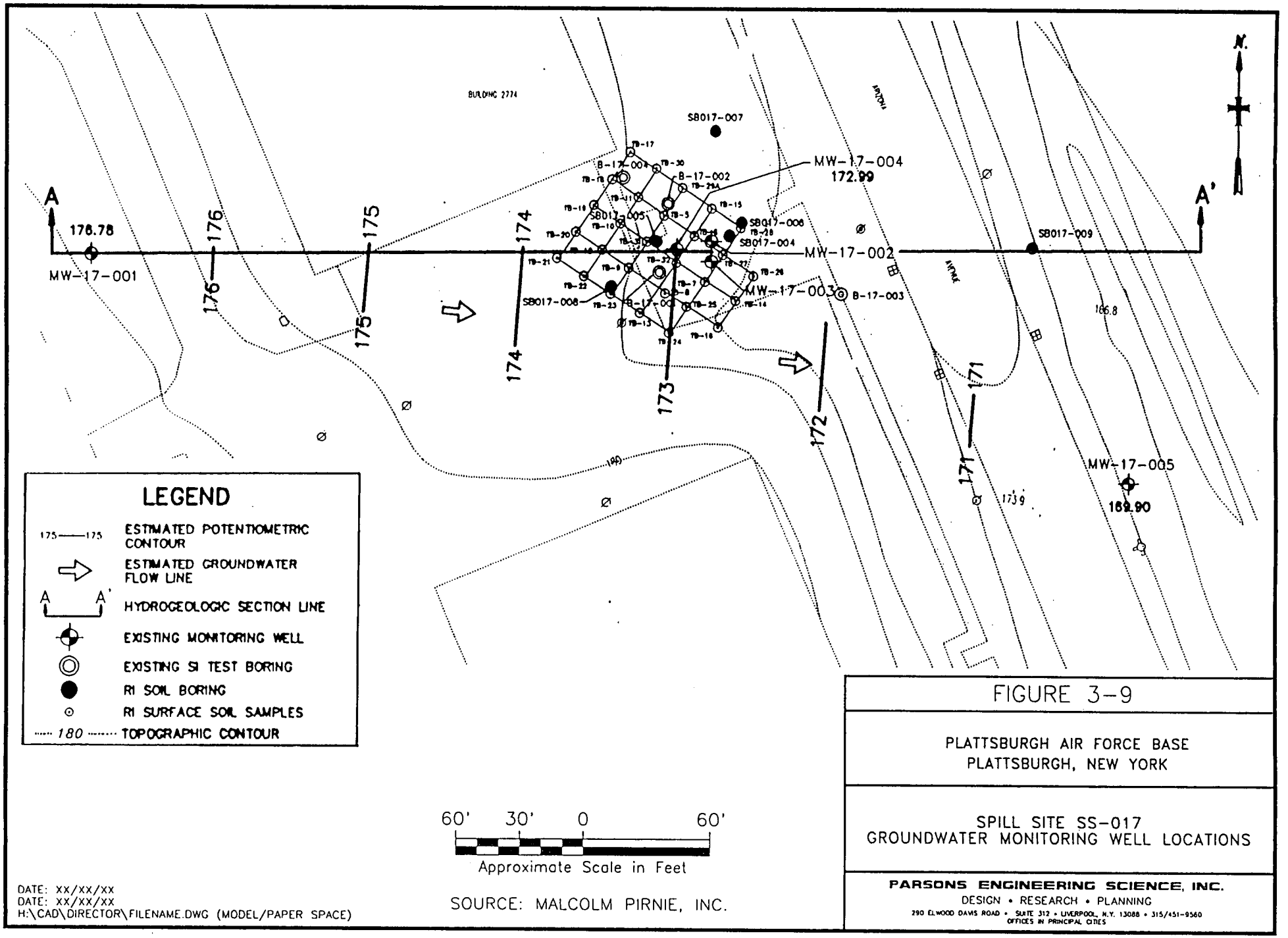
OFFICES IN PRINCIPAL CITIES


BUILDING 2774
SB017-007
MW-17-004
172.99
B-17-004
B-17-002
SB017-005
SB017-006
SB017-004
MW-17-002
SB017-009
A
A'
176.78
MW-17-001
MW-17-003
B-17-003
SB017-008
176
175
174
173
172
171
166.8
173.9
MW-17-005
169.90
N.
LEGEND
175——175 ESTIMATED POTENTIOMETRIC CONTOUR
ESTIMATED GROUNDWATER FLOW LINE
A A' HYDROGEOLOGIC SECTION LINE
EXISTING MONITORING WELL
EXISTING SI TEST BORING
RI SOIL BORING
RI SURFACE SOIL SAMPLES
180 TOPOGRAPHIC CONTOUR
60' 30' 0 60'
Approximate Scale in Feet
SOURCE: MALCOLM PIRNIE, INC.
DATE: XX/XX/XX
DATE: XX/XX/XX
H:\CAD\DIRECTOR\FILENAME.DWG (MODEL/PAPER SPACE)
FIGURE 3-9
PLATTSBURGH AIR FORCE BASE
PLATTSBURGH, NEW YORK
SPILL SITE SS-017
GROUNDWATER MONITORING WELL LOCATIONS
PARSONS ENGINEERING SCIENCE, INC.
DESIGN • RESEARCH • PLANNING
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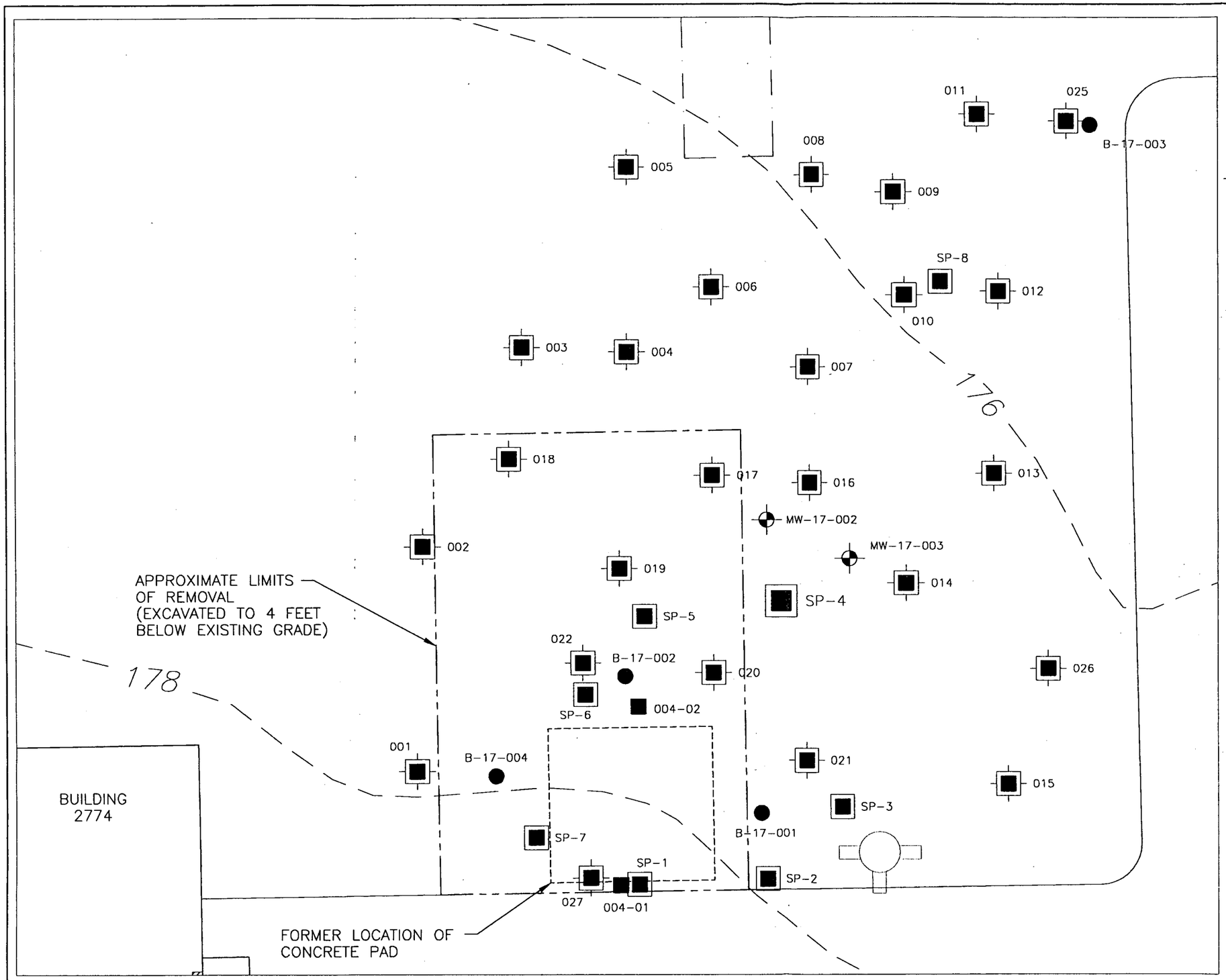
OFFICES IN PRINCIPAL CITIES



LEGEND:

004-01	SOIL SAMPLING LOCATIONS NY STATE DEC, APRIL 1985
SP-1	SOIL SAMPLING LOCATIONS, PLATTSBURGH AFB OCT. 1985
001	SOIL SAMPLING LOCATIONS PLATTSBURGH AFB NOV. 1986
B-17-001	SOIL BORING LOCATIONS, E.C. JORDAN NOV. 1987
MW-17-002	MONITORING WELL LOCATIONS, E.C. JORDAN NOV. 1987
176	TOPOGRAPHIC CONTOUR LINE

10' 5' 0 10'

Approximate Scale in Feet

SOURCE: MALCOLM PIRNIE, INC.
FEBRUARY 1992

DATE: 09/12/96 (SEH)
Xref: NONE
H:\CAD\727307\SS-017\27307G02.DWG (PSPACE= 1/10XP PLOT= CALBW)

FIGURE 3-10

PLATTSBURGH AIR FORCE BASE
PLATTSBURGH, NEW YORK

SPILL SITE SS-017
SOIL REMOVAL ACTION

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TABLE 3.1

SPILL SITE SS-017
SUMMARY OF PRE-SI ANALYTICAL DATA

SOIL SAMPLE STUDY #1 BY NYSDEC,16 APRIL 1985

	SAMPLE ANALYSIS	SAMPLE LOCATION	
1	ORGANIC PRIORITY ANALYSIS	004-01	004-02
a	2,4-DIMETHYLPHENOL	18,000ppb	790,000ppb
b	ACENAPHTHENE	ND*	TRACE**
c	1,2,4-TRICHLOROBENZENE	ND	TRACE
d	2-CHLORONAPHTHALENE	TRACE	ND
e	1,2-DICHLOROBENZENE	TRACE	920,000ppb
f	1,3-DICHLOROBENZENE	TRACE	1,200,000ppb
g	1,4-DICHLOROBENZENE	TRACE	1,000,000ppb
h	NAPHTHALENE	34,000ppb	13,000ppb
i	BIS(2-ETHYLHEXYL)PHTHALATE	TRACE	TRACE
j	BENZO(a)ANTHRACENE	ND	TRACE
k	CHRYSENE	14,000ppb	ND
l	ACENAPHTHYLENE	13,000ppb	ND
m	FLUORENE	TRACE	TRACE
n	PHENANTHRENE	TRACE	TRACE

NOTE: * ND=NONE DETECTED ABOVE THE AVERAGE REPORTING LIMIT OF 3,800 ppb FOR ACIDS AND 5,700PPB FOR B/N.
** TRACE=CONCENTRATIONS DETECTED BELOW THE AVERAGE REPORTING LIMIT.

	SAMPLE ANALYSIS	SAMPLE LOCATION	
2	INORGANIC ANALYSIS EP TOXICITY (METALS)	004-01	004-02
a	CADMIUM	ND*	0.017ppm
3	VOLATILE ORGANIC ANALYSIS EPA 624 METHOD	004-01	004-02
a	TOLUENE	73,000ppb	ND**
b	ETHYLBENZENE	120,000ppb	ND
c	TOTAL XYLENES	640,000ppb	49,000ppb
d	UNKNOWNS	TRACE***	ND
e	TOTAL DICHLOROBENZENES	ND	9,800,000ppb
	DILUTION FACTOR	520,081	570,081
4	PESTICIDE/HERBICIDE ANALYSIS	004-01	004-02
a	ALL COMPOUNDS	ND****	ND

NOTES: * ND=<0.010ppm
**ND=NOT DETECTED
***TRACE=PRESENT
****ND=NOT DETECTED AT OR ABOVE REPORTING LIMIT INDICATED ON DATA SHEET.

TABLE 3.1 (Cont'd)

SPILL SITE SS-017
SUMMARY OF PRE-SI ANALYTICAL DATA

SOIL SAMPLE STUDY #2 OCTOBER 21, 1985
OIL AND GREASES PERFORMED BY SGPB AND DEEV

SAMPLE LOCATION	BASE SAMPLE NUMBER	OILS/GREASES(ug/l)	OILS/GREASES(mg/l)	SAMPLE DEPTH(in)
SP-1	CS850632	27,200	27.2	12
SP-1	CS850633	8,660	8.66	24
SP-2	CS850634	59,800	59.8	12
SP-2	CS850635	14,500	14.5	24
SP-3	CS850636	11,400	11.4	18
SP-4	CS850637	337	0.34	12
SP-5	CS850638	157	0.16	12
SP-6	CS850639	16,900	16.9	12
SP-6	CS850640	14,500	14.5	24
SP-7	CS850641	13,400	13.4	12
SP-7	CS850642	BIT*	BIT*	24
SP-8	CS850643	1,310	1.31	4

BIT* - Broken in Transit

TABLE 3.1 (Cont'd)

SPILL SITE SS-017
SUMMARY OF PRE-SI ANALYTICAL DATA

SOIL STUDY # 2, OCTOBER 21, 1985, ANALYSIS FOR CHLOROBENZENE FAMILY

SAMPLE LOCATION	BASE SAMPLE NUMBER	CHLOROBENZENE	1-2,DICHLOROBENZENE	1-3,DICHLOROBENZENE	1-4,DICHLOROBENZENE	SAMPLE DEPTH(in)
SP-1	CS850652	ND	3,600ppm	ND	20,000ppm	12
SP-1	CS850653	ND	ND	ND	ND	24
SP-2	CS850654	ND	ND	ND	ND	12
SP-2	CS850655	ND	ND	ND	ND	24
SP-3	CS850656	ND	ND	ND	ND	18
SP-4	CS850657	ND	ND	ND	3,400ppm	12
SP-5	CS850658	ND	ND	ND	3,700ppm	12
SP-5	CS850659	610ppm	ND	ND	3,100ppm	12
SP-6	CS850660	ND	ND	ND	4,600ppm	24
SP-7	CS850661	ND	ND	ND	1,400ppm	12
SP-7	CS850662	ND	ND	ND	1,400ppm	24
SP-8	CS850663	ND	ND	ND	1,400ppm	4
SP-1 DUP	CS850664	ND	ND	ND	1,400ppm	12
SP-1 DUP	CS850665	ND	ND	ND	1,400ppm	24
SP-2 DUP	CS850666	ND	ND	ND	700ppm	12
SP-2 DUP	CS850667	ND	ND	ND	1,000ppm	24
SP-3 DUP	CS850668	ND	ND	ND	1,000ppm	18
SP-4 DUP	CS850669	ND	ND	ND	1,000ppm	12
SP-5 DUP	CS850670	ND	1,200ppm	820ppm	3,100ppm	12
SP-6 DUP	CS850671	ND	700ppm	ND	1,300ppm	12
SP-6 DUP	CS850672	ND	ND	ND	ND	24
SP-7 DUP	CS850673	ND	ND	ND	ND	12
SP-7 DUP	CS850674	ND	ND	ND	680ppm	24
SP-7 DUP	CS850675	ND	ND	ND	ND	4

NOTES: DUP = DUPLICATE. SAMPLES DESIGNATED AS DUP WERE NOT SUPPOSED TO BE ANALYZED AS DUPLICATES BUT ACCIDENTALLY WERE. THERE IS ALMOST NO CORRELATION BETWEEN THE ORIGINAL SAMPLES AND THE DUPLICATE, THEREFORE, THIS DATA IS HIGHLY QUESTIONABLE.

TABLE 3.1 (Cont'd)

SPILL SITE SS-017
SUMMARY OF PRE-SI ANALYTICAL DATA

SOIL SAMPLE STUDY #3, NOVEMBER 18, 1986, VOLATILE AROMATICS ANALYSIS

SAMPLE SITE	SAMPLE NUMBER	DEPTH(IN)	BENZENE	TOTAL DICHLOROBENZENES	ETHYLBENZENE	TOLUENE	TOTAL XYLENE
001	GS860454	12	ND	ND	ND	ND	ND
001	GS860455	24	ND	ND	ND	ND	ND
002	GS860456	12	ND	ND	ND	ND	ND
002	GS860457	36	ND	ND	ND	ND	ND
003	GS860458	12	ND	ND	ND	ND	ND
003	GS860459	36	ND	ND	ND	ND	ND
004	GS860460	12	ND	ND	ND	ND	ND
004	GS860461	36	ND	ND	ND	ND	ND
005	GS860462	12	ND	ND	ND	ND	ND
005	GS860463	36	ND	ND	ND	ND	ND
006	GS860464	12	ND	ND	ND	ND	ND
006	GS860465	36	ND	ND	ND	ND	ND
007	GS860466	12	ND	ND	ND	ND	ND
007	GS860467	36	ND	ND	ND	ND	ND
008	GS860468	12	ND	ND	ND	ND	ND
008	GS860469	36	ND	ND	ND	ND	ND
009	GS860470	12	ND	ND	ND	ND	ND
009	GS860471	36	ND	ND	ND	ND	ND
010	GS860472	12	ND	ND	ND	ND	ND
010	GS860473	36	ND	ND	ND	ND	ND
011	GS860474	12	ND	ND	ND	ND	ND
011	GS860475	36	ND	ND	ND	ND	ND
012	GS860476	12	ND	ND	ND	ND	ND
012	GS860477	36	ND	ND	ND	ND	ND
013	GS860478	12	ND	ND	ND	ND	ND
013	GS860479	36	ND	ND	ND	ND	ND
014	GS860480	12	ND	ND	ND	ND	ND
014	GS860481	24	ND	ND	ND	ND	ND
015	GS860482	12	ND	ND	ND	ND	ND
015	GS860483	24	ND	ND	ND	ND	ND
016	GS860484	12	ND	ND	ND	ND	ND
016	GS860485	36	ND	ND	ND	ND	ND
017	GS860486	12	ND	ND	ND	ND	ND
017	GS860487	36	ND	ND	ND	ND	ND
018	GS860488	12	ND	ND	ND	ND	ND
018	GS860489	24	ND	ND	ND	ND	ND
019	GS860490	12	ND	ND	ND	ND	ND
019	GS860491	30	ND	ND	ND	ND	ND
020	GS860492	12	ND	575ug/gm	3.1ug/gm	2.7ug/gm	16.0ug/gm
020	GS860493	36	1.0ug/gm	1360ug/gm	49.0ug/gm	30.0ug/gm	180.0ug/gm
021	GS860473	12	ND	98.0ug/gm	ND	4.9ug/gm	100.0ug/gm
021	GS860473	24	ND	140.0ug/gm	ND	11.0ug/gm	91.0ug/gm
022	GS860473	12	ND	890.0ug/gm	2.0ug/gm	7.9ug/gm	100.0ug/gm
022	GS860473	24	ND	146.0ug/gm	2.8ug/gm	10.0ug/gm	140.0ug/gm

TABLE 3.1 (Cont'd)

SPILL SITE SS-017
SUMMARY OF PRE-SI ANALYTICAL DATA

SOIL SAMPLE STUDY #3, NOVEMBER 18, 1986, VOLATILE AROMATICS ANALYSIS

SAMPLE SITE	SAMPLE NUMBER	DEPTH(IN)	BENZENE	TOTAL DICHLOROBENZENES	ETHYLBENZENE	TOLUENE	TOTAL XYLENE
023	GS860473	12	ND	ND	ND	ND	ND
024	GS860473	12	ND	ND	ND	ND	ND
025	GS860473	12	ND	ND	ND	ND	ND
025	GS860473	SURFACE	ND	ND	ND	ND	ND
026	GS860473	SURFACE	ND	ND	ND	ND	ND
027	GS860503	SURFACE	ND	155.0ug/gm	4.1ug/gm	3.0ug/gm	12.0UG/GM
LOWER DETECTION LIMITS FOR ANALYSES			1.0ug/gm	0.2ug/gm	0.2ug/gm	0.2ug/gm	0.2ug/gm

NOTES: CONVERSION FACTOR 1.0ug/gm=1.0 ppm

TABLE 3-2

SPILL SITE SS-017
SUMMARY OF S.I. SOIL GAS SURVEY DATA

DATE: 10/22/87
TO: 11/02/87 NUMBER OF PROBES: 26

SAMPLE NUMBER	DEPTH OF PROBLE (FT)	HALOCARBONS (ng/L)				HYDROCARBONS (ug/L)			
		TCA	TCE	PCE	TOTAL	BENZENE	TOLUENE	XYLENE	TOTAL
SP13-1	4	366	6695	95	7157	0.05	<0.02	<0.02	0.05
SP13-2	4	12	723	8	743	<0.02	<0.02	<0.02	<0.02
SP13-3	4	5	8720	4	8729	203	615	59	877
SP13-4	4	6	574	1	581	<0.02	1.57	<0.02	1.57
SP13-5	4	11	1052	<1	1063	<0.02	0.4	<0.02	0.4
SP13-6	4	14	2350	<1	2364	<0.02	0.17	<0.02	0.17
SP13-7	4	129	13868	3	14000	4	4	<0.02	8
SP13-8	4	12	795	1	808	<0.02	0.42	<0.02	0.42
SP13-9	4	41	17416	12	17469	SAMPLE LOST - SEPTUM LEAK			
SP13-10	4	1	235	2	238	<0.02	0.61	0.08	0.69
SP13-10D	4	11	1610	13	1634	0.34	0.21	<0.02	0.55
SP13-11	4	2	312	3	317	<0.02	0.29	<0.02	0.29
SP13-12	4	<1	4.7	<1	5	<0.02	0.8	<0.02	0.8
SP13-13	4	<1	17	<1	17	<0.02	1.98	0.32	2.3
SP13-15	4	<1	<1	<1	<1	<0.02	0.17	<0.02	0.17
SP13-16	5	<1	8	<1	8	<0.02	<0.02	0.14	0.14
SP13-17	5	2	12	7	21	<0.02	<0.02	<0.02	<0.02
SP13-18	4	<1	<1	3	3	<0.02	0.11	0.13	0.24
SP13-19	4	1007	2456	14	3476	<0.02	0.13	0.08	0.21
SP13-19D	4	753	1827	15	2595	<0.02	0.17	<0.02	0.17
SP13-20	3.5	<1	<1	<1	<1	<0.02	<0.02	0.07	0.07
SP13-21	4	2	25	<1	27	<0.02	0.05	0.09	0.14
SP13-22	4	<1	6	<1	6	<0.02	0.13	0.09	0.22
SP13-23	4	3	6	2	11	<0.02	0.15	<0.02	0.15
SP13-24	4	<1	3	<1	3	<0.02	0.18	0.06	0.24
SP13-25	4	<1	5	<1	5	<0.02	0.04	<0.02	0.04
SP13-26	4	<1	4	2	6	<0.02	0.08	<0.02	0.08
SP13-31	4	<1	15	1	16	<0.02	<0.02	<0.02	<0.02

NOTE: D DENOTES A DUPLICATE SAMPLE

TABLE 3.3

SPILL SITE SS-017
SUMMARY OF SI ANALYTICAL DATA

SAMPLE LOCATION:				B-17-001		B-17-001		B-17-001		B-17-001		B-17-001	
SAMPLE ID:			SP13SBLANK	SP13TB1131		SP13TB1132		SP13TB1133		SP13TB1134		SP13TB1135	
DATE SAMPLED:			11/05/87	11/05/87		11/05/87		11/05/87		11/05/87		11/06/87	
DEPTH (Ft.):			0	1		2		3		4		5	
MATRIX:			SOIL	SOIL		SOIL		SOIL		SOIL		SOIL	
INORGANIC COMPOUNDS	ANALYTICAL METHOD	CRDL mg/kg											
Aluminum	P	40	NR	NR		NR		NR		1190		NR	
Arsenic	F	2	NR	NR		NR		NR		0.58	[]	NR	
Barium	P	40	NR	NR		NR		NR		298		NR	
Calcium	P	1000	NR	NR		NR		NR		77	[]E*	NR	
Chromium	P	2	NR	NR		NR		NR		4.9		NR	
Copper	P	5	NR	NR		NR		NR		6.1		NR	
Iron	P	2	NR	NR		NR		NR		2750	E	NR	
Magnesium	P	1000	NR	NR		NR		NR		532	[]E*	NR	
Manganese	P	3	NR	NR		NR		NR		18	EN	NR	
Nickel	P	8	NR	NR		NR		NR		5.8	[]	NR	
Vanadium	P	10	NR	NR		NR		NR		2.7	[]E	NR	
Zinc	P	4	NR	NR		NR		NR		55	EN*	NR	
Lead	P/F	1	NR	1.1		2		1		3.6		1.5	
ASSOCIATED BLANK:				A 13108-2		A 13108-2		A 13108-3		A 13108-3		A 13108-3	
VOLATILE ORGANIC COMPOUNDS		CRDL ug/kg											
Benzene		5	-	-		-		-		337600	UJB	-	
Chlorobenzene		5	-	-		-		-		-		6.6	
Chloroform		5	2.5	J	14.4	UJB	12.9	UJB	-		-		1.8	J
Ethylbenzene		5	-		-		-		7200		17000		8.1	
Methylene Chloride		5	63	UJB	117.8	UJB	164.9	UJB	280	J	379800	UJB	73.1	UJB
1,1,2,2-Tetrachloroethane		5	-		-		-		270	J	-		-	
Toluene		5	-		-		6		3600		17000		14	
Trichloroethene		5	-		-		-		280	J	6600		1.6	J
Acetone		10	180	UJB	222.7	UJB	70	UJB	217600	UJB	358699	UJB	209.1	UJB

TABLE 3.3 (Cont'd)

SPILL SITE SS-017
SUMMARY OF SI ANALYTICAL DATA

SAMPLE LOCATION:			B-17-001	B-17-001	B-17-001	B-17-001	B-17-001
SAMPLE ID:		SP13SBLANK	SP13TB1131	SP13TB1132	SP13TB1133	SP13TB1134	SP13TB1135
DATE SAMPLED:		11/05/87	11/05/87	11/05/87	11/05/87	11/05/87	11/06/87
DEPTH (Ft.):		0	1	2	3	4	5
MATRIX:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
4-Methyl-2-Pentanone	10	-	-	-	-	-	-
Xylenes (Total)	5	-	-	-	34000	72000	390
1,2-Dichloroethene(Total)	5	-	-	2000	-	5300	-
DILUTION FACTOR:		1	1.31	1.03	136	211	1.16
ASSOCIATED BLANK:		VBLK1115 GB871115BO3	VBLK1116 GB871116B18	VBLK1117 GC871117A14	VBLK1120	VBLK1118	VBLK1115 GB871115BO3
SEMI-VOLATILE ORGANIC COMPOUNDS	CRDL ug/kg						
Acenaphthene	330	-	NR	NR	230 J	-	NR
Anthracene	330	-	NR	NR	140 J	-	NR
Benzo(a)Anthracene	330	-	NR	NR	93 J	-	NR
bis(2-Chloroisopropyl)Ether	330	-	NR	NR	-	-	NR
1,2-Dichlorobenzene	330	-	NR	NR	41000 D	41000 D	NR
1,3-Dichlorobenzene	330	-	NR	NR	21000 D	23000 D	NR
1,4-Dichlorobenzene	330	-	NR	NR	30000 D	32000 D	NR
Diethylphthalate	330	170 J	NR	NR	-	-	NR
Naphthalene	330	-	NR	NR	15000 D	15000 D	NR
N-Nitroso-Di-n-Propylamine	330	-	NR	NR	-	-	NR
N-Nitrosodiphenylamine(1)	330	-	NR	NR	560	-	NR
Phenanthrene	330	-	NR	NR	68 J	-	NR
1,2,4-Trichlorobenzene	330	-	NR	NR	860 JD	-	NR
Benzyl Alcohol	330	-	NR	NR	-	-	NR
2-Methylnaphthalene	330	-	NR	NR	14000 D	12000 D	NR
2,4-Dimethylphenol	330	-	NR	NR	9200 D	36000 D	NR
4-Chloro-3-Methylphenol	330	36 J	NR	NR	-	-	NR
2-Methylphenol	330	-	NR	NR	34000 D	-	NR
4-Methylphenol	330	-	NR	NR	32000 D	18000 D	NR
bis(2-Ethylhexyl)Phthalate	330	-	NR	NR	750 JD	1000 JD	NR

TABLE 3.3 (Cont'd)

SPILL SITE SS-017
SUMMARY OF SI ANALYTICAL DATA

SAMPLE LOCATION:			B-17-001	B-17-001	B-17-001	B-17-001	B-17-001
SAMPLE ID:		SP13SBLANK	SP13TB1131	SP13TB1132	SP13TB1133	SP13TB1134	SP13TB1135
DATE SAMPLED:		11/05/87	11/05/87	11/05/87	11/05/87	11/05/87	11/06/87
DEPTH (Ft.):		0	1	2	3	4	5
MATRIX:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
DILUTION FACTOR:		33.3			35.8	83.7	
ASSOCIATED BLANK:		SVBLK165303 GJ65303B07			SVBLK171843	SVBLK165303 GJ065303B22	
PESTICIDES/PCB	CRDL ug/kg	-	NR	NR	NR	NR	NR
DILUTION FACTOR:		1					
ASSOCIATED BLANK:		PBLK165304					
PETROLEUM HYDROCARBONS	(mg/kg)	NR	NR	10000	NR	NR	490
pH		7.65			6.25	7.28	
PERCENT SOLIDS		100	76	96	92	79	85

TABLE 3.3 (Cont'd)

SPILL SITE SS-017
SUMMARY OF SI ANALYTICAL DATA

SAMPLE LOCATION:			B-17-002	B-17-002	B-17-002	B-17-002	B-17-002	B-17-003
SAMPLE ID:			SP13TB1141	SP13TB1142	SP13TB1143	SP13TB1144	SP13TB1145	SP13TB1151
DATE SAMPLED:			11/06/87	11/06/87	11/06/87	11/06/87	11/06/87	11/05/87
DEPTH (Ft.):			1	2	3	4	5	1
MATRIX:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
INORGANIC COMPOUNDS	ANALYTICAL METHOD	CRDL mg/kg						
Aluminum	P	40	NR	NR	NR	NR	NR	NR
Arsenic	F	2	NR	NR	NR	NR	NR	NR
Barium	P	40	NR	NR	NR	NR	NR	NR
Calcium	P	1000	NR	NR	NR	NR	NR	NR
Chromium	P	2	NR	NR	NR	NR	NR	NR
Copper	P	5	NR	NR	NR	NR	NR	NR
Iron	P	2	NR	NR	NR	NR	NR	NR
Magnesium	P	1000	NR	NR	NR	NR	NR	NR
Manganese	P	3	NR	NR	NR	NR	NR	NR
Nickel	P	8	NR	NR	NR	NR	NR	NR
Vanadium	P	10	NR	NR	NR	NR	NR	NR
Zinc	P	4	NR	NR	NR	NR	NR	NR
Lead	P/F	1	98 *	0.95 []*	0.9 []*	0.66 []*	1.9 *	163
ASSOCIATED BLANK:			A 13108-5	A 13108-5	A 13108-5	A 13108-5	A 13108-5	A 13108-2
VOLATILE ORGANIC COMPOUNDS		CRDL ug/kg						
Benzene		5	-	-	-	-	-	-
Chlorobenzene		5	-	-	-	-	-	-
Chloroform		5	3 UJB	3 UJB	12.8 UJB	8.8 UJB	14.4 UJB	2.9 UJB
Ethylbenzene		5	2 J	-	-	-	-	-
Methylene Chloride		5	73 UJB	74.3 UJB	72.1 UJB	134.6 UJB	80.8 UJB	174.6 UJB
1,1,2,2-Tetrachloroethane		5	-	-	-	-	-	-
Toluene		5	2.8 J	-	-	-	-	-
Trichloroethene		5	-	-	-	-	-	-
Acetone		10	212 UJB	216 UJB	208.5 UJB	190 UJB	233.8 UJB	74.6 UJB

TABLE 3.3 (Cont'd)

SPILL SITE SS-017
SUMMARY OF SI ANALYTICAL DATA

SAMPLE LOCATION:		B-17-002	B-17-002	B-17-002	B-17-002	B-17-002	B-17-003
SAMPLE ID:		SP13TB1141	SP13TB1142	SP13TB1143	SP13TB1144	SP13TB1145	SP13TB1151
DATE SAMPLED:		11/06/87	11/06/87	11/06/87	11/06/87	11/06/87	11/05/87
DEPTH (Ft.):		1	2	3	4	5	1
MATRIX:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
4-Methyl-2-Pentanone	10	-	-	-	-	-	-
Xylenes (Total)	5	76	-	15	-	-	-
1,2-Dichloroethene(Total)	5	-	-	-	-	-	-
DILUTION FACTOR:		1.06	1.08	1.04	1.12	1.17	1.09
ASSOCIATED BLANK:		VBLK165168	VBLK165168	VBLK165168	VBLK1117 GB871117A11	VBLK165168	165235
SEMI-VOLATILE ORGANIC COMPOUNDS	CRDL ug/kg						
Acenaphthene	330	NR	-	NR	NR	NR	NR
Anthracene	330	NR	-	NR	NR	NR	NR
Benzo(a)Anthracene	330	NR	-	NR	NR	NR	NR
bis(2-Chloroisopropyl)Ether	330	NR	-	NR	NR	NR	NR
1,2-Dichlorobenzene	330	NR	-	NR	NR	NR	NR
1,3-Dichlorobenzene	330	NR	-	NR	NR	NR	NR
1,4-Dichlorobenzene	330	NR	-	NR	NR	NR	NR
Diethylphthalate	330	NR	-	NR	NR	NR	NR
Naphthalene	330	NR	-	NR	NR	NR	NR
N-Nitroso-Di-n-Propylamine	330	NR	-	NR	NR	NR	NR
N-Nitrosodiphenylamine(1)	330	NR	-	NR	NR	NR	NR
Phenanthrene	330	NR	-	NR	NR	NR	NR
1,2,4-Trichlorobenzene	330	NR	-	NR	NR	NR	NR
Benzyl Alcohol	330	NR	-	NR	NR	NR	NR
2-Methylnaphthalene	330	NR	-	NR	NR	NR	NR
2,4-Dimethylphenol	330	NR	-	NR	NR	NR	NR
4-Chloro-3-Methylphenol	330	NR	-	NR	NR	NR	NR
2-Methylphenol	330	NR	-	NR	NR	NR	NR
4-Methylphenol	330	NR	-	NR	NR	NR	NR
bis(2-Ethylhexyl)Phthalate	330	NR	-	NR	NR	NR	NR

TABLE 3.3 (Cont'd)

SPILL SITE SS-017
SUMMARY OF SI ANALYTICAL DATA

SAMPLE LOCATION:	B-17-002	B-17-002	B-17-002	B-17-002	B-17-002	B-17-003
SAMPLE ID:	SP13TB1141	SP13TB1142	SP13TB1143	SP13TB1144	SP13TB1145	SP13TB1151
DATE SAMPLED:	11/06/87	11/06/87	11/06/87	11/06/87	11/06/87	11/05/87
DEPTH (Ft.):	1	2	3	4	5	1
MATRIX:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
DILUTION FACTOR:		36				
ASSOCIATED BLANK:		SVBLK165375				
PESTICIDES/PCB CRDL ug/kg	NR	NR	NR	NR	NR	NR
DILUTION FACTOR:						
ASSOCIATED BLANK:						
PETROLEUM HYDROCARBONS (mg/kg)	18000	NR	58	170	88	380
pH		7.11				
PERCENT SOLIDS	94	93	95	88	85	90

TABLE 3.3 (Cont'd)

SPILL SITE SS-017
SUMMARY OF SI ANALYTICAL DATA

SAMPLE LOCATION:			B-17-003	B-17-003	B-17-003	B-17-003	B-17-003	B-17-004
SAMPLE ID:			SP13TB1152	SP13TB1153	SP13TB1154	SP13TB1155	SP13TB1156	SP13TB1161
DATE SAMPLED:			11/05/87	11/05/87	11/05/87	11/05/87	11/05/87	11/05/87
DEPTH (Ft.):			2	3	4	5	6	1
MATRIX:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
INORGANIC COMPOUNDS	ANALYTICAL METHOD	CRDL mg/kg						
Aluminum	P	40	NR	NR	NR	NR	NR	NR
Arsenic	F	2	NR	NR	NR	NR	NR	NR
Barium	P	40	NR	NR	NR	NR	NR	NR
Calcium	P	1000	NR	NR	NR	NR	NR	NR
Chromium	P	2	NR	NR	NR	NR	NR	NR
Copper	P	5	NR	NR	NR	NR	NR	NR
Iron	P	2	NR	NR	NR	NR	NR	NR
Magnesium	P	1000	NR	NR	NR	NR	NR	NR
Manganese	P	3	NR	NR	NR	NR	NR	NR
Nickel	P	8	NR	NR	NR	NR	NR	NR
Vanadium	P	10	NR	NR	NR	NR	NR	NR
Zinc	P	4	NR	NR	NR	NR	NR	NR
Lead	P/F	1	1.4	5.5	0.98 []	NR	-	51
ASSOCIATED BLANK:			A 13108-3	A 13108-3	A 13108-3		A 13108-3	A 13108-3
VOLATILE ORGANIC COMPOUNDS		CRDL ug/kg						
Benzene		5	-	-	-	-	-	-
Chlorobenzene		5	-	-	-	-	-	-
Chloroform		5	13.6 UJB	13.7 UJB	8.1 UJB	3.3 UJB	1.3 J	13.6 UJB
Ethylbenzene		5	-	-	-	-	-	-
Methylene Chloride		5	106.2 UJB	104.6 UJB	102 UJB	193.5 UJB	75.5 UJB	112.2 UJB
1,1,2,2-Tetrachloroethane		5	-	-	-	-	-	-
Toluene		5	-	-	-	-	-	-
Trichloroethene		5	-	-	-	-	-	-
Acetone		10	224.4 UJB	225.8 UJB	251.9 UJB	82 UJB	215.8 UJB	118.2 UJB

TABLE 3.3 (Cont'd)

SPILL SITE SS-017
SUMMARY OF SI ANALYTICAL DATA

SAMPLE LOCATION:		B-17-003	B-17-003	B-17-003	B-17-003	B-17-003	B-17-004
SAMPLE ID:		SP13TB1152	SP13TB1153	SP13TB1154	SP13TB1155	SP13TB1156	SP13TB1161
DATE SAMPLED:		11/05/87	11/05/87	11/05/87	11/05/87	11/05/87	11/05/87
DEPTH (Ft.):		2	3	4	5	6	1
MATRIX:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
4-Methyl-2-Pentanone	10	-	-	-	-	-	-
Xylenes (Total)	5	-	-	-	-	-	-
1,2-Dichloroethene(Total)	5	-	-	-	-	-	-
DILUTION FACTOR:		1.18	1.19	1.23	1.21	1.2	1.17
ASSOCIATED BLANK:		VBLK1116 GC871116A03	VBLK1116 GC871116A03	VBLK1116 GD871116C18	165235	VBLK1115 GB871115B03	VBLK1116 GC871116A13
SEMI-VOLATILE ORGANIC COMPOUNDS	CRDL ug/kg						
Acenaphthene	330	NR	NR	NR	NR	NR	NR
Anthracene	330	NR	NR	NR	NR	NR	NR
Benzo(a)Anthracene	330	NR	NR	NR	NR	NR	NR
bis(2-Chloroisopropyl)Ether	330	NR	NR	NR	NR	NR	NR
1,2-Dichlorobenzene	330	NR	NR	NR	NR	NR	NR
1,3-Dichlorobenzene	330	NR	NR	NR	NR	NR	NR
1,4-Dichlorobenzene	330	NR	NR	NR	NR	NR	NR
Diethylphthalate	330	NR	NR	NR	NR	NR	NR
Naphthalene	330	NR	NR	NR	NR	NR	NR
N-Nitroso-Di-n-Propylamine	330	NR	NR	NR	NR	NR	NR
N-Nitrosodiphenylamine(1)	330	NR	NR	NR	NR	NR	NR
Phenanthrene	330	NR	NR	NR	NR	NR	NR
1,2,4-Trichlorobenzene	330	NR	NR	NR	NR	NR	NR
Benzyl Alcohol	330	NR	NR	NR	NR	NR	NR
2-Methylnaphthalene	330	NR	NR	NR	NR	NR	NR
2,4-Dimethylphenol	330	NR	NR	NR	NR	NR	NR
4-Chloro-3-Methylphenol	330	NR	NR	NR	NR	NR	NR
2-Methylphenol	330	NR	NR	NR	NR	NR	NR
4-Methylphenol	330	NR	NR	NR	NR	NR	NR
bis(2-Ethylhexyl)Phthalate	330	NR	NR	NR	NR	NR	NR

TABLE 3.3 (Cont'd)

SPILL SITE SS-017
SUMMARY OF SI ANALYTICAL DATA

SAMPLE LOCATION:	B-17-003	B-17-003	B-17-003	B-17-003	B-17-003	B-17-004
SAMPLE ID:	SP13TB1152	SP13TB1153	SP13TB1154	SP13TB1155	SP13TB1156	SP13TB1161
DATE SAMPLED:	11/05/87	11/05/87	11/05/87	11/05/87	11/05/87	11/05/87
DEPTH (Ft.):	2	3	4	5	6	1
MATRIX:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
DILUTION FACTOR:						
ASSOCIATED BLANK:						
PESTICIDES/PCB CRDL ug/kg	NR	NR	NR	NR	NR	NR
DILUTION FACTOR:						
ASSOCIATED BLANK:						
PETROLEUM HYDROCARBONS (mg/kg)	96	-	-	-	98	10000
pH						
PERCENT SOLIDS	85	83	81	82	83	85

TABLE 3.3 (Cont'd)

SPILL SITE SS-017
SUMMARY OF SI ANALYTICAL DATA

SAMPLE LOCATION:			B-17-004	B-17-004
SAMPLE ID:			SP13TB1162	SP13TB1163
DATE SAMPLED:			11/05/87	11/05/87
DEPTH (Ft.):			2	3
MATRIX:			SOIL	SOIL
INORGANIC COMPOUNDS	ANALYTICAL METHOD	CRDL mg/kg		
Aluminum	P	40	NR	NR
Arsenic	F	2	NR	NR
Barium	P	40	NR	NR
Calcium	P	1000	NR	NR
Chromium	P	2	NR	NR
Copper	P	5	NR	NR
Iron	P	2	NR	NR
Magnesium	P	1000	NR	NR
Manganese	P	3	NR	NR
Nickel	P	8	NR	NR
Vanadium	P	10	NR	NR
Zinc	P	4	NR	NR
Lead	P/F	1	17	0.49 []
ASSOCIATED BLANK:			A 13108-3	A 13108-3
VOLATILE ORGANIC COMPOUNDS		CRDL ug/kg		
Benzene		5	-	-
Chlorobenzene		5	-	-
Chloroform		5	-	-
Ethylbenzene		5	-	-
Methylene Chloride		5	34.8 UJB	36 UJB
1,1,2,2-Tetrachloroethane		5	-	-
Toluene		5	-	-
Trichloroethene		5	-	-
Acetone		10	26	13

TABLE 3.3 (Cont'd)

SPILL SITE SS-017
SUMMARY OF SI ANALYTICAL DATA

SAMPLE LOCATION:		B-17-004	B-17-004
SAMPLE ID:		SP13TB1162	SP13TB1163
DATE SAMPLED:		11/05/87	11/05/87
DEPTH (Ft.):		2	3
MATRIX:		SOIL	SOIL
4-Methyl-2-Pentanone	10	-	-
Xylenes (Total)	5	-	-
1,2-Dichloroethene(Total)	5	-	-
DILUTION FACTOR:		1.06	1.03
ASSOCIATED BLANK:		VBLK1115 GC871115C03	VBLK1115 GC871115C03
SEMI-VOLATILE ORGANIC COMPOUNDS	CRDL ug/kg		
Acenaphthene	330	NR	NR
Anthracene	330	NR	NR
Benzo(a)Anthracene	330	NR	NR
bis(2-Chloroisopropyl)Ether	330	NR	NR
1,2-Dichlorobenzene	330	NR	NR
1,3-Dichlorobenzene	330	NR	NR
1,4-Dichlorobenzene	330	NR	NR
Diethylphthalate	330	NR	NR
Naphthalene	330	NR	NR
N-Nitroso-Di-n-Propylamine	330	NR	NR
N-Nitrosodiphenylamine(1)	330	NR	NR
Phenanthrene	330	NR	NR
1,2,4-Trichlorobenzene	330	NR	NR
Benzyl Alcohol	330	NR	NR
2-Methylnaphthalene	330	NR	NR
2,4-Dimethylphenol	330	NR	NR
4-Chloro-3-Methylphenol	330	NR	NR
2-Methylphenol	330	NR	NR
4-Methylphenol	330	NR	NR
bis(2-Ethylhexyl)Phthalate	330	NR	NR

TABLE 3.3 (Cont'd)

SPILL SITE SS-017
SUMMARY OF SI ANALYTICAL DATA

SAMPLE LOCATION:		B-17-004	B-17-004
SAMPLE ID:		SP13TB1162	SP13TB1163
DATE SAMPLED:		11/05/87	11/05/87
DEPTH (Ft.):		2	3
MATRIX:		SOIL	SOIL
DILUTION FACTOR:			
ASSOCIATED BLANK:			
PESTICIDES/PCB	CRDL ug/kg	NR	NR
DILUTION FACTOR:			
ASSOCIATED BLANK:			
PETROLEUM HYDROCARBONS	(mg/kg)	-	52
pH			
PERCENT SOLIDS		94	97

TABLE 3-4
SPILL SITE SS-017
SUPPLEMENTAL DELINEATION INVESTIGATION
SOIL GAS SCREENING SURVEY RESULTS

SAMPLE I.D.	COMPOUND DETECTED	REPORTED DETECTION	UNITS	SAMPLE DEPTH (ft. bgs)
A-3	Trichloroethylene	1790	ppb	3.75
A-4	Toluene	457	ppb	4.25
A-4	Trichloroethylene	3700	ppb	4.25
A-5	Toluene	8300	ppb	4.25
A-5	Xylene	15000	ppb	4.25
A-5	Dichlorobenzene	13000	ppb	4.25
A-5	Trichloroethylene	21300	ppb	4.25
A-7	Tetrachloroethene	169	ppb	4.25
A-8	Tetrachloroethene	56	ppb	4.25
B-3	Trichloroethylene	29880	ppb	3.75
B-4	Xylene	1000	ppb	4.25
B-4	Dichlorobenzene	8070	ppb	4.25
B-4	Trichloroethylene	68500	ppb	4.25
B-5	Xylene	7800	ppb	4.25
B-5	Trichloroethylene	82700	ppb	4.25
B-6	Dichlorobenzene	3040	ppb	4.25
B-7	Tetrachloroethene	273	ppb	4.25
B-8	Tetrachloroethene	52	ppb	3.75
C-3	Trichloroethylene	28000	ppb	3.75
C-4	Benzene	189	ppb	4.25
C-4	Dichlorobenzene	5610	ppb	4.25
C-4	Trichloroethylene	85600	ppb	4.25
C-6	Dichlorobenzene	2300	ppb	4.25
C-7	Tetrachloroethene	143	ppb	4.25

TABLE 3-4 (CONT'D)
SPILL SITE SS-017
SUPPLEMENTAL DELINEATION INVESTIGATION
SOIL GAS SCREENING SURVEY RESULTS

SAMPLE I.D.	COMPOUND DETECTED	REPORTED DETECTION	UNITS	SAMPLE DEPTH (ft. bgs)
C-8	Tetrachloroethene	140	ppb	3.75
D-3	Toluene	200	ppb	3.75
D-3	Trichloroethylene	2500	ppb	3.75
D-6	Dichlorobenzene	456	ppb	4.25
D-7	Tetrachloroethene	142	ppb	4.25
D-8	Tetrachloroethene	241	ppb	2
D-9	Tetrachloroethene	647	ppb	3.75
D-10	Trichloroethylene	1016	ppb	3.75
D-10	Tetrachloroethene	353	ppb	3.75
D-11	Trichloroethylene	3333	ppb	3.75
D-12	Trichloroethylene	1904	ppb	2
E-4	Benzene	335	ppb	4.25
E-4	Xylene	209	ppb	4.25
E-4	Trichloroethylene	7100	ppb	4.25
E-5	Benzene	700	ppb	4.25
E-7	Tetrachloroethene	125	ppb	2
E-7-1	Tetrachloroethene	101	ppb	4.25
E-8	Tetrachloroethene	143	ppb	3.75
E-9	Trichloroethylene	244	ppb	3.75
E-9	Tetrachloroethene	1294	ppb	3.75
E-10	Trichloroethylene	3082	ppb	3.75
E-10	Tetrachloroethene	538	ppb	3.75
E-11	Trichloroethylene	7069	ppb	3.75

TABLE 3-4 (CONT'D)
SPILL SITE SS-017
SUPPLEMENTAL DELINEATION INVESTIGATION
SOIL GAS SCREENING SURVEY RESULTS

SAMPLE I.D.	COMPOUND DETECTED	REPORTED DETECTION	UNITS	SAMPLE DEPTH (ft. bgs)
E-11	Tetrachloroethene	381	ppb	3.75
E-12	Trichloroethylene	14814	ppb	2
F-4	Dichlorobenzene	2000	ppb	4.25
F-7	Tetrachloroethene	40	ppb	4.25
F-8	Tetrachloroethene	69	ppb	3.75
F-9	Trichloroethylene	225	ppb	3.75
F-9	Tetrachloroethene	1184	ppb	3.75
F-10	Trichloroethylene	2057	ppb	3.75
F-10	Tetrachloroethene	466	ppb	3.75
F-11	Trichloroethylene	6153	ppb	3.75
F-11	Tetrachloroethene	233	ppb	3.75
F-12	Trichloroethylene	2208	ppb	2
H-5	Benzene	53000	ppb	2
H-5	Toluene	78000	ppb	2
H-5	Ethylbenzene	40000	ppb	2
H-5	Xylene	100000	ppb	2
H-5	Trichloroethylene	420000	ppb	2
H-5-1	Benzene	50000	ppb	3.75
H-5-1	Toluene	78000	ppb	3.75
H-5-1	Ethylbenzene	42500	ppb	3.75
H-5-1	Xylene	100000	ppb	3.75
H-5-1	Trichloroethylene	430000	ppb	3.75
H-6	Benzene	500	ppb	3.75
H-6	Toluene	7800	ppb	3.75
H-6	Trichloroethylene	12800	ppb	3.75
H-6	Tetrachloroethene	818	ppb	3.75
H-7	Tetrachloroethene	585	ppb	3.75

TABLE 3-4 (CONT'D)
SPILL SITE SS-017
SUPPLEMENTAL DELINEATION INVESTIGATION
SOIL GAS SCREENING SURVEY RESULTS

SAMPLE I.D.	COMPOUND DETECTED	REPORTED DETECTION	UNITS	SAMPLE DEPTH (ft. bgs)
H-8	Tetrachloroethene	558	ppb	3.75
J-6	Benzene	125000	ppb	2
J-6	Toluene	181000	ppb	2
J-6	Trichloroethylene	2000000	ppb	2
N1-2	Trichloroethylene	111	ppb	2.75
N2-2	Trichloroethylene	512	ppb	2.5
N3-2	Trichloroethylene	886	ppb	2.5
N4-1	Trichloroethylene	585	ppb	3.75
N4-2	Trichloroethylene	994	ppb	2.5
N5-1	Trichloroethylene	2250	ppb	2
N5-2	Trichloroethylene	3306	ppb	2.5
N6-1	Trichloroethylene	1091	ppb	2.5
N6-2	Trichloroethylene	4169	ppb	2.5
N7-1	Trichloroethylene	135	ppb	2.5
N7-2	Trichloroethylene	1850	ppb	2.5

TABLE 3-5
SPILL SITE SS-017
SUPPLEMENTAL DELINEATION INVESTIGATION
SOIL SAMPLE RESULTS

SAMPLE I.D.	ANALYSIS	COMPOUND DETECTED	TAGM 4046 LIMIT	REPORTED DETECTION	UNITS	SAMPLE DEPTH (ft. bgs)	PID READING (ppm)
17-SS-01	TCL VOC	Methylene Chloride	1	2.47 J	ug/kg	2.5-3.5	52
17-SS-01	TCL BNA	p-Chloro-m-cresol	2.4	78.7 J	ug/kg	2.5-3.5	52
17-SS-02	TCL VOC	Methylene Chloride	1	8.02	ug/kg	3-4	0.6
17-SS-03	TCL VOC	Methylene Chloride	1	48.5	ug/kg	1-2	1.2
17-SS-03	TCL VOC	Trichloroethylene	7	175	ug/kg	1-2	1.2
17-SS-04	TCL VOC	Methylene Chloride	1	31.5 J	ug/kg	0.5-1.5	1.6
17-SS-04	TCL VOC	Trichloroethylene	7	99.7	ug/kg	0.5-1.5	1.6
17-SS-04	TCL BNA	p-Chloro-m-cresol	2.4	54.5 J	ug/kg	0.5-1.5	1.6
17-SS-05	TCL VOC	Methylene Chloride	1	7.49	ug/kg	3.5-4.5	0
17-SS-06	TCL VOC	Methylene Chloride	1	2.73 J	ug/kg	3.5-4	0
17-SS-07	TCL VOC	Ethylbenzene	55	2740	ug/kg	3.5-4	1315
17-SS-07	TCL VOC	Methylene Chloride	1	6710	ug/kg	3.5-4	1315
17-SS-07	TCL VOC	Naphthalene	130	25000	ug/kg	3.5-4	1315
17-SS-07	TCL VOC	Trichloroethylene	7	1090 J	ug/kg	3.5-4	1315
17-SS-07	TCL VOC	Xylenes, total	12	21200	ug/kg	3.5-4	1315
17-SS-07	TCL VOC	Total VOCs	10000	157940	ug/kg	3.5-4	1315
17-SS-07	TCL BNA	2-Methylnaphthalene	384	25600	ug/kg	3.5-4	1315
17-SS-07	TCL BNA	Acenaphthalene	900	1120 J	ug/kg	3.5-4	1315
17-SS-07	TCL BNA	Dibenzofuran	62	947 J	ug/kg	3.5-4	1315
17-SS-07	TCL BNA	Naphthalene	130	15700	ug/kg	3.5-4	1315
17-SS-07	TCL BNA	Phenanthrene	2200	4010	ug/kg	3.5-4	1315
17-SS-08	TCL VOC	Methylene Chloride	1	2.22 J	ug/kg	3-4	0
17-SS-09	TCL VOC	Methylene Chloride	1	4.49 J	ug/kg	3-4	0
17-SS-10	TCL VOC	Methylene Chloride	1	4.88 J	ug/kg	3.5-4	0
17-SS-11	TCL VOC	Methylene Chloride	1	2.56 J	ug/kg	3-4	0
17-SS-12	TCL VOC	Methylene Chloride	1	2.63 J	ug/kg	3-4	0
17-SS-13	TCL VOC	Methylene Chloride	1	3.11 J	ug/kg	3-4	0
17-SS-14	TCL VOC	Methylene Chloride	1	2.88 J	ug/kg	1-2	0.9
17-SS-15	TCL VOC	Methylene Chloride	1	2.84 J	ug/kg	3-4	0
17-SS-16	TCL VOC	Methylene Chloride	1	40.6	ug/kg	1-2	1.8

TABLE 3-5 (CONT'D)
SPILL SITE SS-017
SUPPLEMENTAL DELINEATION INVESTIGATION
SOIL SAMPLE RESULTS

SAMPLE I.D.	ANALYSIS	COMPOUND DETECTED	TAGM 4046 LIMIT	REPORTED DETECTION		UNITS	SAMPLE DEPTH (ft. bgs)	PID READING (ppm)
17-SS-17	TCL VOC	Methylene Chloride	1	9.81		ug/kg	0-1	0.8
17-SS-17	TCL BNA	Benzo(a)anthracene	30	290	J	ug/kg	0-1	0.8
17-SS-17	TCL BNA	Benzo(a)pyrene	61	241	J	ug/kg	0-1	0.8
17-SS-17	TCL BNA	Benzo(b)fluoranthene	11	233	J	ug/kg	0-1	0.8
17-SS-17	TCL BNA	Benzo(k)fluoranthene	11	242	J	ug/kg	0-1	0.8
17-SS-17	TCL BNA	Chrysene	4	337	J	ug/kg	0-1	0.8
17-SS-17	TCL BNA	Indeno(1,2,3-cd)pyrene	32	142	J	ug/kg	0-1	0.8
17-SS-18	TCL VOC	Methylene Chloride	1	3.91	J	ug/kg	3-4	0.3
17-SS-19	TCL VOC	Methylene Chloride	1	3.25	J	ug/kg	3-4	0.5
17-SS-20	TCL VOC	Methylene Chloride	1	2.27	J	ug/kg	3-4	0.3
17-SS-21	TCL VOC	Methylene Chloride	1	1.32	J	ug/kg	3-4	20.2
17-SS-22	TCL VOC	Methylene Chloride	1	1.59	J	ug/kg	2-3	64.7
17-SS-22	TCL BNA	Di-n-butyl phthalate	81	99.6	J	ug/kg	2-3	64.7
17-SS-23	TCL VOC	Methylene Chloride	1	25.6		ug/kg	1-2	40
17-SS-23	TCL BNA	Naphthalene	130	324	J	ug/kg	1-2	40
17-SS-24	TCL VOC	Methylene Chloride	1	19.6	J	ug/kg	1.5-2.5	9
17-SS-24	TCL VOC	Trichloroethylene	7	11.5		ug/kg	1.5-2.5	9
17-SS-25	TCL VOC	Methylene Chloride	1	4.48	J	ug/kg	1-2	6
17-SS-26	TCL VOC	Methylene Chloride	1	1.86	J	ug/kg	1-2	0.1
17-SS-27	TCL VOC	Methylene Chloride	1	2.99	J	ug/kg	1-2	2.5
17-SS-28	TCL VOC	Methylene Chloride	1	17.8		ug/kg	1-2	1.4
17-SS-29	TCL VOC	Methylene Chloride	1	62.9		ug/kg	0.5-2	20
17-SS-30	TCL VOC	Methylene Chloride	1	14.8		ug/kg	2-3	11
17-SS-31	TCL VOC	Methylene Chloride	1	16.2		ug/kg	2.5-3.5	57
17-SS-32	TCL VOC	1,1,1-Trichloroethane	7.6	622		ug/kg	2.5-3.5	1260
17-SS-32	TCL VOC	Methylene Chloride	1	2540	J	ug/kg	2.5-3.5	1260
17-SS-32	TCL VOC	Naphthalene	130	7470		ug/kg	2.5-3.5	1260
17-SS-32	TCL VOC	Trichloroethylene	7	6730		ug/kg	2.5-3.5	1260

TABLE 3-5 (CONT'D)
SPILL SITE SS-017
SUPPLEMENTAL DELINEATION INVESTIGATION
SOIL SAMPLE RESULTS

SAMPLE I.D.	ANALYSIS	COMPOUND DETECTED	TAGM 4046 LIMIT	REPORTED DETECTION	UNITS	SAMPLE DEPTH (ft. bgs)	PID READING (ppm)
17-SS-32	TCL VOC	Xylenes, total	12	13600	ug/kg	2.5-3.5	1260
17-SS-32	TCL VOC	Total VOCs	10000	65562	ug/kg	2.5-3.5	1260
17-SS-32	TCL BNA	2-Methylnaphthalene	364	5810	ug/kg	2.5-3.5	1260
17-SS-32	TCL BNA	Naphthalene	130	4590	ug/kg	2.5-3.5	1260
17-SS-33	TCL VOC	Methylene Chloride	1	2.53 J	ug/kg	3-4	0.1
17-SS-34	TCL VOC	Methylene Chloride	1	12.3	ug/kg	2.5-3.5	0.2
17-SS-35	TCL VOC	Methylene Chloride	1	4.15 J	ug/kg	0.5-2	1
17-SS-36	TCL VOC	Methylene Chloride	1	8.35	ug/kg	0.5-2	0.9
17-SS-36	TCL BNA	Di-n-butyl phthalate	81	106 J	ug/kg	0.5-2	0.9
17-SS-37	TCL VOC	Methylene Chloride	1	2.76 J	ug/kg	3-4	0.1
17-SS-38	TCL VOC	Methylene Chloride	1	7.97	ug/kg	0.5-2	29
17-SS-38	TCL BNA	Benzo(a)anthracene	30	146 J	ug/kg	0.5-2	29
17-SS-38	TCL BNA	Benzo(a)pyrene	61	122 J	ug/kg	0.5-2	29
17-SS-38	TCL BNA	Benzo(b)fluoranthene	11	121 J	ug/kg	0.5-2	29
17-SS-38	TCL BNA	Benzo(k)fluoranthene	11	99.4 J	ug/kg	0.5-2	29
17-SS-38	TCL BNA	Chrysene	4	131 J	ug/kg	0.5-2	29
17-SS-38	TCL BNA	Di-n-butyl phthalate	81	112 J	ug/kg	0.5-2	29
17-SS-39	TCL VOC	Methylene Chloride	1	1.87 J	ug/kg	3-4	0.4
17-SS-40	TCL VOC	Methylene Chloride	1	4.96 J	ug/kg	0.5-2	5.8
17-SS-40	TCL BNA	Benzo(a)anthracene	30	178 J	ug/kg	0.5-2	5.8
17-SS-40	TCL BNA	Benzo(a)pyrene	61	152 J	ug/kg	0.5-2	5.8
17-SS-40	TCL BNA	Benzo(b)fluoranthene	11	158 J	ug/kg	0.5-2	5.8
17-SS-40	TCL BNA	Benzo(k)fluoranthene	11	147 J	ug/kg	0.5-2	5.8
17-SS-40	TCL BNA	Chrysene	4	190 J	ug/kg	0.5-2	5.8
17-SS-40	TCL BNA	Indeno(1,2,3-cd)pyrene	32	101 J	ug/kg	0.5-2	5.8
17-SS-41	TCL VOC	Methylene Chloride	1	2.48 J	ug/kg	0.5-2	1.5
17-SS-42	TCL VOC	Methylene Chloride	1	4.33 J	ug/kg	0.5-2	3.7
17-SS-43	TCL VOC	Methylene Chloride	1	2.27 J	ug/kg	3-4	0
17-SS-44	TCL VOC	Methylene Chloride	1	2.31 J	ug/kg	3-4	0
17-SS-45	TCL VOC	Methylene Chloride	1	2.25 J	ug/kg	3-4	0
17-SS-46	TCL VOC	Methylene Chloride	1	3.84 J	ug/kg	3-4	0

TABLE 3-5 (CONT'D)
SPILL SITE SS-017
SUPPLEMENTAL DELINEATION INVESTIGATION
SOIL SAMPLE RESULTS

SAMPLE I.D.	ANALYSIS	COMPOUND DETECTED	TAGM 4046 LIMIT	REPORTED DETECTION	UNITS	SAMPLE DEPTH (ft. bgs)	PID READING (ppm)
17-SS-47	TCL VOC	1,2-Dichlorobenzene	79	107	ug/kg	3-4	0
17-SS-47	TCL VOC	Methylene Chloride	1	12.6	ug/kg	3-4	0
17-SS-47	TCL BNA	1,2-Dichlorobenzene	79	460	ug/kg	3-4	0
17-SS-48	TCL VOC	Methylene Chloride	1	2.16 J	ug/kg	3-4	0
17-SS-49	TCL VOC	Methylene Chloride	1	2.24 J	ug/kg	3-4	0
17-SS-49	TCL BNA	Benzo(a)anthracene	30	106 J	ug/kg	3-4	0
17-SS-49	TCL BNA	Benzo(a)pyrene	61	93.8 J	ug/kg	3-4	0
17-SS-49	TCL BNA	Benzo(b)fluoranthene	11	111 J	ug/kg	3-4	0
17-SS-49	TCL BNA	Benzo(k)fluoranthene	11	89.7 J	ug/kg	3-4	0
17-SS-49	TCL BNA	Chrysene	4	111 J	ug/kg	3-4	0
17-SS-50	TCL VOC	Methylene Chloride	1	2.56 J	ug/kg	3-4	0
17-SS-50	TCL BNA	Benzo(b)fluoranthene	11	42.4 J	ug/kg	3-4	0
17-SS-50	TCL BNA	Benzo(k)fluoranthene	11	42.8 J	ug/kg	3-4	0
17-SS-51	TCL VOC	Methylene Chloride	1	2.58 J	ug/kg	3-4	0
17-SS-51	TCL BNA	Benzo(a)anthracene	30	107 J	ug/kg	3-4	0
17-SS-51	TCL BNA	Benzo(a)pyrene	61	82.6 J	ug/kg	3-4	0
17-SS-51	TCL BNA	Benzo(b)fluoranthene	11	82.9 J	ug/kg	3-4	0
17-SS-51	TCL BNA	Benzo(k)fluoranthene	11	70.3 J	ug/kg	3-4	0
17-SS-51	TCL BNA	Chrysene	4	120 J	ug/kg	3-4	0
17-SS-53	TCL VOC	Methylene Chloride	1	2.53 J	ug/kg	3-4	0
17-SS-54	TCL VOC	Methylene Chloride	1	2.3 J	ug/kg	3-4	0
17-SS-55	TCL VOC	Methylene Chloride	1	2.15 J	ug/kg	3-4	0
17-SS-56	TCL VOC	Methylene Chloride	1	2.74 J	ug/kg	3-4	0
17-SS-57	TCL VOC	Methylene Chloride	1	3.77 J	ug/kg	3-4	0
17-SS-59	TCL VOC	Methylene Chloride	1	4.39 J	ug/kg	3-4	0
17-SS-60	TCL VOC	Methylene Chloride	1	9.63	ug/kg	3-4	0
17-SS-60	TCL VOC	Trichloroethylene	7	37.9	ug/kg	3-4	0
17-SS-61	TCL VOC	Methylene Chloride	1	4.73 J	ug/kg	2.5-4	21
17-SS-61	TCL VOC	Trichloroethylene	7	1100	ug/kg	2.5-4	21
17-SS-64	TCL VOC	Methylene Chloride	1	3.21 J	ug/kg	3-4	0

TABLE 3-5 (CONT'D)
SPILL SITE SS-017
SUPPLEMENTAL DELINEATION INVESTIGATION
SOIL SAMPLE RESULTS

SAMPLE I.D.	ANALYSIS	COMPOUND DETECTED	TAGM 4046 LIMIT	REPORTED DETECTION	UNITS	SAMPLE DEPTH (ft. bgs)	PID READING (ppm)
17-SS-65	TCL VOC	Methylene Chloride	1	5.58	ug/kg	3-4	0
17-SS-66	TCL BNA	Benzo(a)anthracene	30	43 J	ug/kg	1-3.5	6
17-SS-66	TCL BNA	Benzo(b)fluoranthene	11	36.7 J	ug/kg	1-3.5	6
17-SS-66	TCL BNA	Chrysene	4	47.5 J	ug/kg	1-3.5	6
17-SS-67	TCL BNA	Benzo(a)anthracene	30	125 J	ug/kg	2-3.5	0
17-SS-67	TCL BNA	Benzo(a)pyrene	61	110 J	ug/kg	2-3.5	0
17-SS-67	TCL BNA	Benzo(b)fluoranthene	11	106 J	ug/kg	2-3.5	0
17-SS-67	TCL BNA	Benzo(k)fluoranthene	11	104 J	ug/kg	2-3.5	0
17-SS-67	TCL BNA	Chrysene	4	151 J	ug/kg	2-3.5	0
17-SS-67	TCL BNA	Indeno(1,2,3-cd)pyrene	32	64.2 J	ug/kg	2-3.5	0
B-6(3-4)	TCL VOC	Methylene Chloride	1	30	ug/kg	3-4	0
E6(3-4)	VOC	Benzene	0.6	4.63	ug/kg	3-4	0
E6(3-4)	VOC	Xylenes, total	12	14.14	ug/kg	3-4	0
F1(3-4)	VOC	Benzene	0.6	1.74	ug/kg	3-4	0
H-5(3-4)	TCL VOC	Methylene Chloride	1	17.4	ug/kg	3-4	30.1
IBS-1	TCL VOC	Methylene Chloride	1	7.76	ug/kg	4-5	0
IBS-2	TCL VOC	Methylene Chloride	1	2.8 J	ug/kg	3.5-4	0
IBS-3	TCL VOC	Methylene Chloride	1	4.52 J	ug/kg	2-3	0
IBS-4	TCL VOC	Methylene Chloride	1	10.1	ug/kg	2-3	0
J6(0-2)	VOC	1,2-Dichlorobenzene	79	38100	ug/kg	0-2	900
J6(0-2)	VOC	1,4-Dichlorobenzene	85	4940	ug/kg	0-2	900
J6(0-2)	VOC	Benzene	0.6	7180	ug/kg	0-2	900
J6(0-2)	VOC	Ethylbenzene	55	1900	ug/kg	0-2	900
J6(0-2)	VOC	Toluene	15	1103	ug/kg	0-2	900
J6(0-2)	VOC	Trichloroethylene	7	3640	ug/kg	0-2	900
J6(0-2)	VOC	Xylenes, total	12	81600	ug/kg	0-2	900
J6(6)	VOC	1,2-Dichlorobenzene	79	26300	ug/kg	6	110
J6(6)	VOC	1,4-Dichlorobenzene	85	4840	ug/kg	6	110
J6(6)	VOC	Benzene	0.6	2240	ug/kg	6	110
J6(6)	VOC	Ethylbenzene	55	143	ug/kg	6	110
J6(6)	VOC	Tetrachloroethene	14	292	ug/kg	6	110
J6(6)	VOC	Toluene	15	242	ug/kg	6	110

TABLE 3-5 (CONT'D)
SPILL SITE SS-017
SUPPLEMENTAL DELINEATION INVESTIGATION
SOIL SAMPLE RESULTS

SAMPLE I.D.	ANALYSIS	COMPOUND DETECTED	TAGM 4046 LIMIT	REPORTED DETECTION	UNITS	SAMPLE DEPTH (ft. bgs)	PID READING (ppm)
J6(6)	VOC	Trichloroethylene	7	57.2	ug/kg	6	110
J6(6)	VOC	Xylenes, total	12	20100	ug/kg	6	110
N5-1(1-2)	TCL VOC	Methylene Chloride	1	82.2	ug/kg	1-2	0
N5-1(1-2)	TCL VOC	Trichloroethylene	7	17.1	ug/kg	1-2	0
N5-1(1-2)	TCL BNA	Di-n-butyl phthalate	81	213 J	ug/kg	1-2	0

J Sample concentration estimated due to matrix interference

TABLE 3.6

SPILL SITE SS-017
SUMMARY OF SI GROUNDWATER ANALYTICAL DATA

SAMPLE LOCATION:			MW-17-002		MW-17-003		MW-17-001	
SAMPLE ID:			JMW114XX01		JMW115XX01		JMW113XX01	
DATE SAMPLED:			12/09/87		12/09/87		12/09/87	
DEPTH (FT.):			0		0		0	
MATRIX:			WATER		WATER		WATER	
INORGANIC COMPOUNDS	ANALYTICAL METHOD	CRDL ug/l						
Aluminum	P	200	-		-		-	
Arsenic	F	10	19.5	UJB	19.5	UJB	19.5	UJB
Barium	P	200	11	[]	11	[]	13	[]
Cadmium	P	5	-		-		-	
Calcium	P	5000	52200		46700		50300	
Cobalt	P	50	5.2	[]E	5.9	[]E	5.2	[]E
Copper	P	25	-		-		-	
Iron	P	100	5600		3000		168	
Lead	P/F	5	-		-		-	
Magnesium	P	5000	11600	E	11500	E	12700	E
Manganese	P	15	1300		1220		6120	
Mercury	CV	0.2	-		-		-	
Potassium	P	5000	2740	[]	3240	[]	2370	[]
Sodium	P	5000	8360	E	6210	E	4600	[]E
Vanadium	P	50	6	[]	4.5	[]	5.4	[]
Zinc	P	20	55	UJB	55	UJB	55	UJBE
ASSOCIATED BLANK:			13108M		13108M		13108M	
VOLATILE ORGANIC COMPOUNDS		CRDL ug/l						
Benzene		5	1.6	J	-		-	
Chloroform		5	-		-		-	
Ethylbenzene		5	20		-		-	
Methylene Chloride		5	14	UJB	14	UJB	14	UJB
Toluene		5	-		-		-	
Trichloroethene		5	-		4.1	J	-	
Acetone		10	-		-		-	
2-Butanone		10	-		-		-	
1,2-Dichloroethene(Total)		5	2.5	J	-		-	
Xylenes (Total)		5	21		-		-	
DILUTION FACTOR:			1		1		1	
ASSOCIATED BLANK:			VBLK1214		VBLK1214		VBLK1214	
SEMI-VOLATILE ORGANIC COMPOUNDS		CRDL ug/l						
Acenaphthene		10	2.2	J	-		-	
bis(2-Ethylhexyl)Phthalate		10	9.2	J	5.2	J	4.8	J
Naphthalene		10	8.4	J	-		-	
2-Methylnaphthalene		10	11	J	-		-	
DILUTION FACTOR:			2		2		2	
ASSOCIATED BLANK:			SVBLK171804		SVBLK171804		SVBLK17470	

SECTION 4

THREATS TO PUBLIC HEALTH, WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

4.1 THREATS TO PUBLIC HEALTH, WELFARE OR THE ENVIRONMENT

4.1.1 Hazard Identification

As reported previously in this document, environmental sampling has shown elevated levels of VOCs and SVOCs, specifically TCE, benzene, xylenes, and dichlorobenzenes (DCBs). These chemical contaminants have been identified in soil samples collected from borings taken at Site SS-017. Direct human contact with these contaminants is unlikely if the site is not disturbed.

For the purposes of this Action Memorandum, chemical contamination is discussed in the context of the potential for additional degradation of groundwater which may be used for public consumption. The potential for contamination to leach from soils into the groundwater is what has prompted this removal action. The fate and transport of contaminated groundwater and potential downgradient receptors are being considered as part of the ongoing groundwater investigation.

4.1.2 Description of Contaminants

4.1.2.1 Toxicity

The primary references for toxicity data for all compounds included:

- USEPA, 1994. Integrated Risk Information System (IRIS). On-line data base. March.
- USEPA, 1994a. Health Effects Assessment Summary Tables (HEAST). Office of Emergency and Remedial Response. March.

Additional references for TCE toxicity included:

- ATSDR, 1988. Toxicological Profile for Trichloroethylene, Draft. Agency for Toxic Substances and Disease Registry. USPHS/USEPA. January.
- USEPA, 1994b. Personal communication from M. Cowles of USEPA to K. Scruton of Parsons Engineering Science, Inc. Environmental Criteria Assessment Office, Chemical Mixtures Assessment Branch. 13 October, 1994.

Trichloroethene: TCE has anesthetic properties, and inhalation of high concentrations causes unconsciousness in humans. Links to cancer and birth defects in humans are uncertain. Neither IRIS nor HEAST currently provide toxicity values for TCE. The USEPA has not resolved the weight-of-evidence classification of TCE, and currently places it in either Group C (possible human carcinogen) or Group 2 (probable human carcinogen). It has also been described as being on a Group "C-B2" continuum.

Benzene: Benzene is absorbed into the body following ingestion, inhalation, and dermal contact, and must undergo metabolic transformation to exert its toxic effects. Metabolism occurs primarily in the liver, and to a lesser extent in the bone marrow. The primary targets of benzene toxicity are the central nervous system and the blood. Benzene is genotoxic to humans and the USEPA has placed it in weight-of-evidence cancer Group A, indicating that it is a human carcinogen.

Xylenes: The primary target of xylenes toxicity is the central nervous system. Xylenes are considered to be nongenotoxic. The USEPA has placed xylenes in weight-of-evidence Group D, indicating that they are not classifiable as human carcinogens.

Dichlorobenzenes: Information on the human health effects of DCB is limited. However, studies performed on animals have shown that chronic oral exposure to DCBs can cause a number of effects including cirrhosis of the liver, focal necrosis and higher kidney and liver weight. Central nervous system depression, membrane irritation, hemotoxicity, liver damage, sensitization and respiratory effects have been reported following subchronic oral exposure. No information on the toxicity of 1,2-DCB resulting from direct acute or chronic skin contact is available. 1,4 DCB is listed as a Group "C" carcinogen by the USEPA.

4.1.2.2 Fate and Transport

The primary reference for the fate and transport information was:

- Howard, P.H., 1990. Handbook of Environmental Fate and Exposure Data for Organic Chemicals, Vol. II: Solvents. Lewis Publishers, Inc. Chelsea, Michigan.

Trichloroethene: TCE released to soil will partially evaporate and partially leach to the groundwater, where it may remain for a long time. It is highly mobile in soils, where there is some degradation to other chlorinated alkenes. Since it is only somewhat soluble in water and substantially denser, when it occurs as a separate phase it tends to sink to the bottom of the aquifer. However, no separate phase hydrocarbons have ever been found at Site SS-017. Significant biodegradation can take place when TCE is cometabolized in the presence of BTEX compounds. Cometabolic degradation means that TCE is biodegraded concurrently with BTEX compounds by microorganisms that utilize BTEX compounds as their primary carbon source. Enzymes and/or cofactors produced by the microorganisms act on the TCE rendering it bioavailable for the microorganisms (Wilson, et. al., 1985, Little, et. al., 1988, Fox, et. al., 1990).

Evaporation is the primary removal mechanism in surface water. Biodegradation, hydrolysis, and photooxidation are extremely slow by comparison. Adsorption to sediment and bioconcentration in aquatic organisms are insignificant. TCE in the atmosphere will be present in the vapor phase and is rapidly degraded.

Benzene: Benzene will rapidly volatilize from surface soil and water. That which does not volatilize from permeable surface and subsurface soils will be highly to very highly mobile, and can be expected to leach to nearby groundwater which is not protected by a confining layer. It is fairly soluble, and will be carried with groundwater to discharge points. It is subject to biodegradation in soils, shallow

groundwater, and surface water. Benzene will not be expected to significantly adsorb to sediment, bioconcentrate in aquatic organisms, or hydrolyze. Photodegradation may be a significant removal mechanism in surface waters which are not conducive to microbial degradation. Benzene will undergo significant photodegradation in air, but may be washed out with rain.

Xylenes: Xylenes are moderately mobile in soil and may leach to groundwater where they are known to persist for several years despite evidence of biodegradation in both soil and groundwater. The dominant removal process in surface water is volatilization, but this is not a rapid process. Some adsorption to sediment will occur. Once released to the atmosphere, xylenes will undergo photochemical degradation at a moderate rate.

Dichlorobenzenes: DCBs in surface water undergo rapid volatilization, with half-lives of several hours. Hydrolysis, oxidation, and direct photolysis are not expected to be significant fate processes in water. Of particular significance is that DCBs adsorb onto sediment particles and hence persist in the aquatic environment. In soils, DCBs adsorb moderately to strongly, and undergo slow biodegradation under aerobic conditions. Direct volatilization from the soil surface is an important mechanism for the removal of DCBs from soils.

4.1.3 Contaminant Action Levels

At the present time, there are no federal standards for soil cleanup. Therefore, other criteria must be used to evaluate site contamination. The NYSDEC Division of Hazardous Waste Remediation has issued a Technical and Administrative Guidance Memorandum (HWR-94-4046), titled "Determination of Soil Cleanup Objectives and Cleanup Levels" (TAGM 4046), January 24, 1994.

Cleanup of the vadose zone soils at Spill Site SS-017 at Plattsburgh AFB will be considered complete when the recommended cleanup levels as specified under NYSDEC TAGM HWR-94-4046 are met, or when asymptotic removal of contaminants is reached and no significant additional removal can be expected to occur.

The recommended maximum allowable soil concentrations for the major organic contaminants found at Site SS-017 as specified under NYSDEC TAGM HWR-94-4046 are as follows:

4.1.3.1 Trichloroethene (RCO = 7 μg/kg)

Trichloroethene was detected during the 1996 Supplemental Delineation Investigation at a maximum concentration of 6,730 μg/kg at Geoprobe® location 17-SS-32. This value exceeds the 7 μg/kg allowable contaminant concentration in the soil as provided in TAGM 4046.

4.1.3.2 Benzene (RCO = 0.6 μg/kg)

Benzene was detected during the 1996 Supplemental Delineation Investigation at a maximum concentration of 7,160 μg/kg at Geoprobe® location J-6 at a depth of six feet. This value exceeds the 0.6 μg/kg allowable contaminant concentration in the soil as provided in TAGM 4046.

4.1.3.3 Xylenes (RCO = 12 μg/kg)

Total xylenes was detected during the 1996 Supplemental Delineation Investigation at a maximum concentration of 81,600 μg/kg at Geoprobe® location J-6 at a depth of two feet. This value exceeds the 12 μg/kg allowable contaminant concentration in the soil as provided in TAGM 4046.

4.1.3.4 1,2 Dichlorobenzene (RCO = 79 μg/kg)

This compound was detected at a concentration of 41,000 μg/kg at soil boring location B-17-001 at a depth of four feet bgs during the Site Investigation. This value exceeds the 79 μg/kg allowable contaminant concentration in soil provided in TAGM 4046. The PAFB sampling program detected 1,2-DCB at concentrations that exceeded the guidance soil concentration in three locations at Site SS-017.

4.1.3.5 1,3 Dichlorobenzene (RCO = 15.5 μg/kg)

This compound was detected at a concentration of 23,000 μg/kg at location B-17-001 at a depth of four feet bgs. This value exceeds the 15.5 μg/kg allowable concentration as provided in TAGM 4046. The PAFB sampling program detected 1,3-DCB at concentrations that exceeded the guidance soil concentration in one location at SS-017.

4.1.3.6 1,4 Dichlorobenzene (RCO = 85 μg/kg)

This compound was detected at a concentration of 32,000 μg/kg at location B-17-001 at a depth of four feet bgs. This value exceeds the 85 μg/kg allowable concentration as calculated using the Water/Soil Partition Model. The PAFB sampling program detected 1,4-DCB at concentrations that exceeded the guidance soil concentration in 17 locations at SS-017.

4.1.3.7 Total Volatile Organic Compounds

TAGM 4046 limits soil cleanup objectives for total VOCs to less than or equal to 10 mg/kg (10,000 μg/kg). The second PAFB sampling program at the site detected total VOCs above this level at seven locations.

4.1.4 Conclusions

Previous field investigations at Spill Site SS-017 indicate elevated levels of certain VOC and SVOC compounds. The soil cleanup objectives for selected VOCs in TAGM 4046 are based on protection of groundwater. Comparing the various VOC concentrations detected in site soil samples to these objectives indicates that there is a potential for several of the VOCs present at Site SS-017 to eventually leach into the groundwater at concentrations that would exceed the NYSDEC groundwater and NYS Department of Health drinking water standards.

Most of the samples collected at Site SS-017 have been analyzed for VOCs and SVOCs. The cleanup levels for Site SS-017 have been based on the most frequently detected VOCs (i.e. TCE, benzene, xylenes, and DCBs). It is anticipated that remediation for these compounds will effectively remove other VOCs and SVOCs.

SECTION 5

ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances from this site if not addressed by implementing the removal action selected in this Action Memorandum, may present a potential endangerment to public health and the environment. If this removal action is not implemented, there is potential for additional contaminants to reach the groundwater and migrate off-site in the direction of groundwater flow. This may increase the potential for contact with off-site receptors, through the use of contaminated groundwater as a potable water source.

SECTION 6

PROPOSED REMOVAL ACTION AND ESTIMATED COSTS

6.1 PROPOSED REMOVAL ACTION

6.1.1 Overview

The proposed removal action includes remediation of vadose zone soils using SVE and bioventing. Selected VOCs (i.e. TCE, benzene, xylenes, and DCBs) will be used as the indicator compounds to determine the effectiveness of the removal action in remediating the residual vadose zone soil contamination. A full-scale SVE and bioventing system will be installed based on the type of contamination found at the site. SVE will be implemented in those areas shown to contain TCE in addition to other non-chlorinated petroleum hydrocarbons. Bioventing will be implemented in those areas shown to contain only non-chlorinated petroleum hydrocarbons. This removal action alternative was selected based on site investigation data and the USEPA's Presumptive Remedy Approach for soils contaminated with VOCs and SVOCs (EPA-540-93-048).

SVE and bioventing are recommended to treat the vadose zone soils at Spill Site SS-017 based on the following:

- High permeability fine to medium grained sandy soils.
- Volatile chlorinated organic hydrocarbons are generally effectively removed by SVE.
- Residual less volatile non-chlorinated hydrocarbons are removed by *in situ* biodegradation as a result of oxygen intake during active SVE.
- Volatile and non-volatile non-chlorinated hydrocarbons generally are effectively biodegraded by bioventing.
- Existing asphalt pavement over the entire treatment area generally enhances SVE and bioventing performance.

6.1.2 Treatment Area

The cleanup objectives for Spill Site SS-017 are outlined in Section 4 of this document. The data obtained from pre-SI field investigations, the RI and the Supplemental Delineation Investigation indicate that there are five separate areas of vadose zone contamination at Spill Site SS-017 (Figure 6-1). The two largest areas were found to lie between Buildings 2774 and 2753, and to the east of Building 2753. The area between the two buildings is approximately 160 feet by 200 feet in size. The area east of Building 2753 measures approximately 60 feet by 100 feet. These areas were shown to contain TCE in addition to other non-chlorinated petroleum hydrocarbons. A third smaller and isolated area shown to contain TCE was found immediately to the north of Building 2774. This area measures approximately 40 feet in diameter. The other two areas of contaminated soil were found off the southeast

corner of Building 2774, and off the northeast corner of Building 2753. These two areas each measure approximately 40 feet in diameter and were found to contain only non-chlorinated petroleum hydrocarbons.

6.1.3 Detailed Description

The SVE system to be installed to treat the two larger areas of contaminated soil (Figure 6-1) will consist of up to four horizontal extraction wells manifolded to a single regenerative vacuum blower. Three of the horizontal wells will run from near the former concrete pad location at Building 2774 to just beyond the west side of the buildings. The fourth extraction well will run from the equipment enclosure to the area of contaminated soil located on the east side of Building 2753. All four wells will be placed at a depth of four feet bgs and will be constructed of 4-inch diameter PVC. The wells will be sealed from the atmosphere to prevent short-circuiting of air above the well screen. The well screens will be connected to four inch diameter PVC riser pipes which will extend to the ground surface and connect the regenerative blower to the extraction wells. The layout of the proposed SVE system is presented on Figure 6-1.

SVE will also be implemented at the third smaller and isolated area of contaminated soil located immediately north of Building 2774 (Figure 6-1). This smaller SVE system will consist of a single vertical extraction well connected to a separate regenerative blower.

Based on the relatively small areas of contamination and low levels of volatile contaminants it is not anticipated that off-gas treatment will be necessary. However, to ensure that New York State emission limits are not exceeded, activated carbon will be used during start-up to treat the SVE off-gas and the system will be operated at a relatively low flow rate.

Bioventing systems will be installed at the two areas shown to contain only non-chlorinated hydrocarbons (Figure 6-1). A single vertical air injection well will be installed in the center of each contaminated area. The wells will be connected to approximately 1-Hp regenerative blowers to provide the air for bioventing. The wells will be constructed of 4-inch diameter PVC well screen set at a maximum depth of eight feet. This well depth should be able to accommodate groundwater table fluctuations throughout the year.

Up to six vapor monitoring points will also be installed in the vicinity of the SVE and bioventing systems. The points will be installed at locations of between 5 and 50 feet from the extraction and/or injection wells to monitor the system progress. These points will be used for the collection of soil gas samples for field analysis of VOCs, oxygen, and carbon dioxide analyses. These are the typical parameters that are monitored at a SVE/bioventing system.

6.1.4 Disposal of Waste

Trench spoils and well cuttings will be used as backfill material during the installation of the extraction wells. Trench spoils accumulated above the volume utilized as backfill will be placed in Pit 2 of Fire Training Area FT-002. This pit is soon to undergo treatment via SVE and bioventing and will adequately remove any contaminants from the minimal volume of Spill Site SS-017 trench spoils placed there.

If off-gas treatment is required, the spent granular activated carbon will be shipped back to the supplier for regeneration and reuse. No other wastes are expected to be generated from the operation of the SVE system.

6.1.5 Contribution to Remedial Performance

The proposed removal action is being implemented to remediate contaminated soils and prevent additional contaminants from reaching the groundwater. The main objective of the removal action is to remediate vadose zone soils containing VOC and SVOC contaminants.

6.1.6 Description of Alternative Technologies

The proposed removal action is considered to be "time critical" and does not require the preparation of an Engineering Evaluation/Cost Analysis (EE/CA) or a review of alternative technologies. This remedial technology was selected using the USEPA's Presumptive Remedy Approach for soils contaminated with VOCs and SVOCs (EPA-540-F-93-048).

6.1.7 Engineering Evaluation/Cost Analysis (EE/CA)

Time critical removal actions do not require the preparation of an EE/CA.

6.1.8 Applicable or Relevant and Appropriate Requirements (ARARs)

6.1.8.1 General

All ARARs will be strictly adhered to during the removal action. The following ARARs have been identified for this removal action:

- Standards Applicable to Generators of Hazardous Waste (Title 40, Section 262, Code of Federal Regulations).
- Contingency Plan and Emergency Procedures (Title 40, Section 264, Subpart D, Code of Federal Regulations).
- General Facility Standards and Operations (Title 40, Section 264, Code of Federal Regulations).
- Hazardous Materials Regulations (Title 29, Section 1910, Code of Federal Regulations).
- Health and Safety Program (Title 29, Section 1910, Code of Federal Regulations).
- NYSDEC Hazardous Waste Management Regulations (Title 6, NYCRR, Part 373).
- (Title 49, Parts 171 through 179, Code of Federal Regulations).
- TAGM HWR-94-4046 Determination of Soil Cleanup Objectives and Cleanup Levels (Revised) January 24, 1994.
- NYSDEC Air Regulations (Title 6, NYCRR Part 200)
- NYSDEC Air Regulations (Title 6, NYCRR Part 201)
- NYSDEC Air Regulations (Title 6, NYCRR Part 211)

- NYSDEC Air Regulations (Title 6, NYCRR Part 212)
- NYSDEC Air Regulations (Title 6, NYCRR Part 257)
- Air Guide 1 - Guidelines for the Control of Toxic Ambient Air Contaminants

6.1.8.2 Removal Action

The National Oil and Hazardous Substance Pollution Contingency Plan (NCP) Section 300.415 lists eight factors which shall be considered in determining the appropriateness of a removal action. The following factors apply to Site SS-017;

- Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants;
- High levels of hazardous substances, pollutants, or contaminants in soils largely at or near the surface that may migrate; and
- Other situations or factors that may pose threats to the public health or welfare or the environment (i.e., the possibility for groundwater contamination).

The following factors do not apply to Site SS-017:

- Actual or potential contamination of drinking water supplies or sensitive ecosystems; groundwater is not currently used as a potable water source, and sensitive ecosystems are not in danger;
- Hazardous substances or pollutants in drums, barrels, tanks or other bulk storage containers, that pose a threat of release; all bulk storage containers have been removed;
- Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released do not exist at the site;
- Threat of fire or explosion does not exist at the site; and
- The availability of other appropriate federal or state response mechanisms to respond to the release do not exist at this site.

6.1.9 Project Schedule

Time critical removal actions require a planning period of less than six months be initiated. The six month planning period begins with the receipt of this Action Memorandum by the NYSDEC and USEPA. To meet time objectives, the following schedule is proposed:

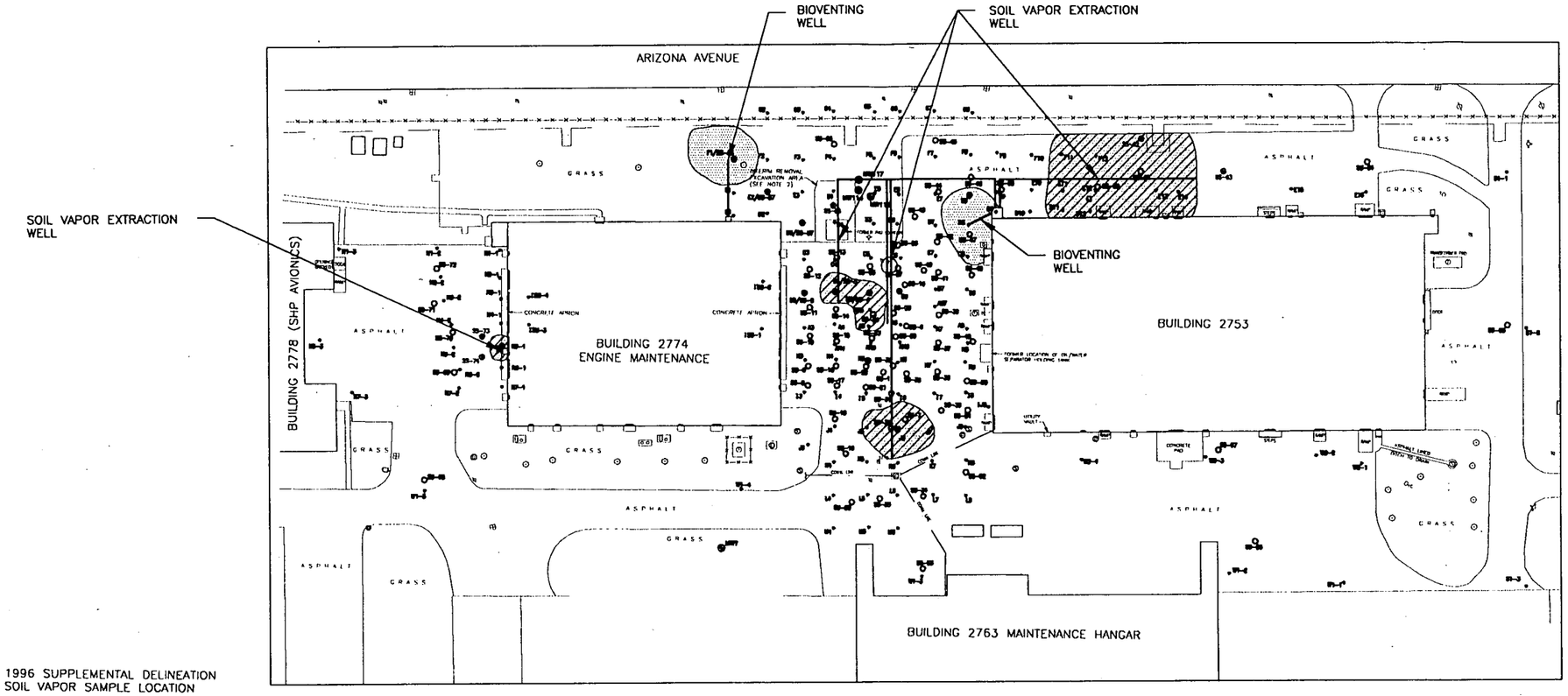
- September 1996 Submit Action Memorandum to NYSDEC.
- October 1996 Install and start-up SVE and bioventing system.
- July 1996 (Approx) Submit Draft Closure Report to NYSDEC and USEPA.
- Sept. 1996 (Approx) Submit Final Closure Report to NYSDEC and USEPA.

6.2 ESTIMATED COSTS

A preliminary cost estimate has been prepared based on the following assumptions:

- The work will be done by one prime contractor who may subcontract some work items.
- No off-gas treatment will be required for the full-scale SVE system.
- The expected duration of the active SVE system will be less than two years.

The total estimated cost for the removal action is between $100,000 and $500,000.



LEGEND:

- 1996 SUPPLEMENTAL DELINEATION SOIL VAPOR SAMPLE LOCATION
- 1996 SUPPLEMENTAL DELINEATION SOIL SAMPLE LOCATION
- SOIL VAPOR/SOIL SAMPLE LOCATION
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- FIRE HYDRANT LOCATION
- UTILITY POLE
- STORM DRAIN
- SEWER MANHOLE
- TRANSFORMER
- COMMUNICATION LINES
- DOOR
- SOIL AREA TO BE REMEDIATED BY BIOVENTING
- SOIL AREA TO REMEDIATED BY SOIL VAPOR EXTRACTION

100' 50' 0 100'
Approximate Scale in Feet

SOURCE: OHM REMEDIATION SERVICES CORP.
PROJECT No. 17257
DRAWING No. 17257-D5

DATE: 09/12/96 (SEH)
Xref: 17257-D5.DWG
H:\CAD\727307\SS-017\27307G08.DWG (PSPACE= VARIES PLOT= CALBW)

FIGURE 6-1

PLATTSBURGH AIR FORCE BASE
PLATTSBURGH, NEW YORK

SPILL SITE SS-017
PROPOSED SOIL VAPOR EXTRACTION AND BIOVENTING SYSTEM LAYOUT

PARSONS ENGINEERING SCIENCE, INC.
DESIGN • RESEARCH • PLANNING
290 ELWOOD DAVIS ROAD • SUITE 312 • LIVERPOOL, N.Y. 13088 • 315/451-9560
OFFICES IN PRINCIPAL CITIES

SECTION 7

EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

As previously discussed, there is a potential for additional VOC and SVOC contaminants to leach into the groundwater and subsequently migrate off-site. If this removal action is not implemented, the potential exists for additional contaminants to reach the groundwater and migrate downward and in the direction of groundwater flow. Should this occur, exposure to human populations, animals, and the food chain could occur.